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INTEGRATED REGULATORY REVIEW SERVICE (IRRS)

FOLLOW-UP MISSION

TO

VIET NAM

Hanoi, Viet Nam

29 September to 9 October 2014

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY

IAEA Integrated Regulatory Review Service IRRS

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Mission date:	*29 September to 9 October 2014*
Regulatory body:	*Viet Nam Agency for Radiation and Nuclear Safety (VARANS)*
Location:	*Hanoi*
Organized by:	*International Atomic Energy Agency (IAEA)*

IRRS REVIEW TEAM

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The number of recommendations, suggestions and good practices is in no way a measure of the status of the regulatory body. Comparisons of such numbers between IRRS reports from different countries should not be attempted.

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EXECUTIVE SUMMARY

At the request of the Viet Nam Agency for Radiation and Nuclear Safety (VARANS), an IAEA team of international experts performed a follow up peer review of Viet Nam's national regulatory infrastructure for radiation and nuclear safety from 29 September to 9 October 2014. The aim of the follow up mission was to review measures undertaken following the recommendations and suggestions from the 2009 mission and the status of further development of the regulatory safety infrastructure to support Viet Nam's nuclear power programme.

The 2009 mission reviewed the existing regulatory infrastructure for the uses of radioactive materials and nuclear facilities in Viet Nam. In addition the mission reviewed the development of safety infrastructure for the national nuclear power programme in accordance with DS-424, the draft safety standard for establishing a safety infrastructure for a national nuclear power programme (now published as SSG-16, "Establishing the Safety Infrastructure for a Nuclear Power Programme).

The IRRS follow-up team determined that 22 recommendations and 8 suggestions made during the 2009 mission had been effectively addressed and could be considered closed; and that 1 recommendation could be closed on the basis of progress made and confidence in their effective completion. This leaves 44 recommendations and 28 suggestions that need to be further addressed to ensure that the IAEA safety standards are appropriately implemented.

In relation to the preparations for nuclear power that was reviewed against SSG-16, the team considered that 14 recommendations and 9 suggestions made during the 2009 mission had been effectively addressed and could be considered closed. This leaves 9 recommendations and 2 suggestions from the 2009 mission that need to be addressed in addition to the ongoing effort required to further develop the nuclear safety infrastructure.

As was the case in the 2009 mission, the Review Team noted that an open and transparent attitude was consistently demonstrated by VARANS staff. It was evident that significant effort to improve many areas had been expended since the last mission.

The IRRS Team also appreciated and acknowledged VARANS' continued participation in international cooperation activities and the IRRS Team encourages continued efforts in these activities, particularly as associated with the design, construction, and operation of a nuclear power plant.

Particular strengths of the Vietnamese regulatory systems and VARANS were similar to those noted in the 2009 IRRS mission and include the following:

- Commitment of the VARANS staff to develop legislation and regulations in the field of nuclear and radiation safety, particularly as associated with the authorization process;

- Efforts of the VARANS staff to benchmark it practices using internationally recognized standards and good practices; and

- A willingness to receive feedback regarding the efforts to establish and implement a program to effectively regulate radiation and nuclear activities.

The team also noted that VARANS has made significant progress in the development of the regulatory framework to support the introduction of nuclear power in Viet Nam.

The IRRS Review Team believes that consideration of the following areas should be given a high priority to further strengthen radiation and nuclear safety in Viet Nam:

Independence of Regulatory Decision Making

During the 2009 IRRS mission, the IRRS Review Team found a potential conflict of interest since MOST, MOIT, and MONRE all contain bodies that are involved in regulating, promoting, and operating radiation and nuclear activities. During this Follow-Up IRRS mission, the team found that this potential conflict of interest continues to exist. It is difficult to see clear, effective independence in the decision making of the regulatory body, which is a requirement of IAEA Safety Standards and the Convention for Nuclear Safety, to which Viet Nam is a party. These issues should be resolved in the amendment of the 2008 Law on Atomic Energy.

Fulfilling Key Regulatory Responsibilities

The following areas highlight key concerns related to some of the main regulatory functions.

Licensing

The lack of effective regulatory independence is particularly evident in the area of licensing of nuclear reactors where organizations that issue licenses and organizations that operate reactors are within the same ministry. This potential for conflict of interests applies to the current research reactor as well as the future NPP reactors. Furthermore, the licensing responsibilities are fragmented between Ministries, which is a challenge for ensuring regulatory effectiveness.

Inspection

Inspection is a key function of a regulatory body. There are currently 12 inspectors working for VARANS of which 10 are contracted and only 2 are permanent staff. This is insufficient to cover inspection of existing radiation facilities and the research reactor. The lack of resources will be critical with the increasing tasks for the inspection of the safety of the ongoing nuclear power programme.

Emergency Preparedness & Response

The draft National Nuclear Emergency Response Plan has been prepared, and should be finalized and implemented as a matter of priority. Further efforts are needed to develop emergency response capability, including procedures, training and exercises.

Staffing, Financing and Technical Competence of VARANS

An essential component of the continued development of VARANS, as the competent agency in radiation and nuclear safety, is the sufficient and reliable provision of human and financial resources that are needed to fulfill its statutory responsibilities. In that regard, additional resources are needed for regulating the existing radiation facilities and research reactor.

MOST should continue its efforts to increase the capacity of VARANS in relation to regulating the nuclear power programme. At the same time, the team has concerns that this is at the detriment of regulating existing radiation facilities and the research reactor. VARANS and MOST are therefore encouraged to ensure that balance is kept between regulating current facilities and activities while at the same time building competence to regulate the nuclear power programme.

Attention should be given to continuing to develop, through effective education and training, the technical competence of all VARANS staff, including areas not associated with nuclear power.

Development of Nuclear Safety Infrastructure for Nuclear Power Programme

The draft Master Plan for the Development of Nuclear Power Infrastructure should be finalized and implemented with a high priority in the areas of nuclear safety.

I. INTRODUCTION

At the request of the Viet Nam Agency for Radiation and Nuclear Safety (VARANS), an IAEA convened team of international experts performed a peer review of Viet Nam's national regulatory infrastructure for radiation and nuclear safety, in accordance with the Guidelines of the IAEA Integrated Regulatory Review Service (IRRS). The IRRS mission took place from 28 September to 9 October 2009. The IRRS Team reviewed the following areas: legislative and governmental responsibilities; responsibilities and functions of the regulatory body; organization of the regulatory body; the authorization process; review and assessment; inspection and enforcement; the development of regulations and guides; and the management system of the regulatory body. In addition, at the request of the regulatory body, the mission scope included a review of regulatory oversight of the following thematic areas: Code of Conduct on the Safety and Security of Radioactive Sources; emergency preparedness and response; control of medical exposures; education and training. A review was also made of the existing safety infrastructure for a national nuclear power programme, in accordance with DS-424, the draft safety standard for establishing a safety infrastructure for a national nuclear power programme (now published as SSG-16).

Through an evaluation of the effectiveness of VARANS regulatory activities and organizational structure, the IRRS mission identified regulatory improvements in safety and provided the opportunity to share experience and knowledge among the staff of VARANS and the international reviewers. Noting that bodies other than VARANS are involved in the regulatory process for radiation and nuclear activities, the IRRS team also considered the relative interdependencies, functions and responsibilities of those other bodies.

In September 2012, Professor Vuong Huu Tan, Director General of VARANS requested that IAEA organize an IRRS follow-up mission in 2014. The dates of the mission were subsequently agreed to be 29 September to 9 October 2014. The aim of the mission was to review measures undertaken following the recommendations and suggestions from the 2009 mission, including a review of progress made in developing the regulatory infrastructure associated with the proposed nuclear power programme.

The IRRS follow-up team consisted of 8 regulatory experts from 6 IAEA Member States (Canada, France, Pakistan, Slovenia, United Arab Emirates and USA) plus 3 IAEA staff members. The IRRS follow-up review team noted the transparent and learning attitude of VARANS staff and their openness throughout this mission. The team members also appreciated the openness and co-operation they received from staff of the other organizations met during the mission, including the Ministry of Science and Technology (MOST), Viet Nam Institute for Atomic Energy (VINATOM) and Viet Nam Electricity (EVN).

During this follow-up mission, the IRRS team determined that 22 recommendations and 9 suggestions made during the 2009 mission had been effectively addressed and could be considered closed; and that 1 recommendation could be closed on the basis of progress made and confidence in their effective completion. In relation to the preparations for nuclear power that was reviewed against SSG-16, the team considered that 14 recommendations and 9 suggestions made during the 2009 mission had been effectively addressed and could be considered closed.

II. OBJECTIVE AND SCOPE

The purpose of the follow-up mission was to review the measures undertaken following the recommendations and suggestions identified in the 2009 IRRS mission report that covered the following areas:

- Legislative and governmental responsibilities;
- Responsibilities and functions of the regulatory body;
- Organization of the regulatory body;
- Authorization process; review and assessment; inspection and enforcement;
- Development of regulations and guides;
- Management system of the regulatory body;
- Regulatory infrastructure associated with a proposed nuclear power programme;
- Thematic areas:
    - Code of Conduct on the Safety and Security of Radioactive Sources;
    - Emergency preparedness and response;
    - Control of medical exposures; and
    - Education and training.

At the request of VARANS, no new review areas were included in the follow-up mission, although the status of the safety infrastructure for nuclear power development was again reviewed in accordance with IAEA Safety Guide SSG-16.

The key objectives of this mission were to:

- Assist Viet Nam to enhance its regulatory infrastructure for nuclear and radiation safety, as well as emergency preparedness and response;
- Provide Viet Nam and VARANS recommendations and suggestions for further improvement;
- Provide VARANS staff with an opportunity to discuss their practices with reviewers who have experience with different practices in the same field;
- Provide reviewers from IAEA Member States and the IAEA staff with opportunities to broaden their experience and knowledge of their own fields;
- Contribute to the harmonization of regulatory approaches among IAEA Member States;
- Promote the sharing of experience and exchange of lessons learned; and

- Provide other States with information regarding good practices identified in the course of the review.

II. BASIS FOR THE REVIEW

A) PREPARATORY WORK AND IAEA REVIEW TEAM

At the request of VARANS, a preparatory meeting for the follow-up Integrated Regulatory Review Service (IRRS) was conducted from 8 to 9 April 2014. The preparatory meeting was carried out by the Team Leader Mr John Kinneman, Deputy Team Leader Mr Ian Grant and the IRRS IAEA Team representatives, Mr John Wheatley (Team Coordinator) and Mr David Graves (Deputy Team coordinator).

The IRRS mission preparatory team had discussions regarding the scope and duration of the follow-up mission with the senior management of VARANS. The discussions resulted in agreement that the follow up mission would focus on reviewing progress made in implementing the recommendations and suggestions that were identified during the 2009 IRRS mission.

The proposed IRRS Review team composition (senior regulators from Member States to be involved in the review) was discussed and the size of the IRRS Review team was tentatively confirmed. Logistics including meeting and work space, identification of counterparts and Liaison Officer, proposed visits, lodging and transportation arrangements were also addressed.

The VARANS Liaison Officer for the preparatory meeting and the IRRS mission was Mr Dang Thanh Luong.

VARANS provided IAEA (and the review team) with the advance reference material for the review at the end of August/early September, including the result of a new self-assessment against SSG-16.

B) REFERENCE FOR THE REVIEW

The most relevant IAEA safety standards and the Code of Conduct on the Safety and Security of Radioactive Sources were used as review criteria. A more complete list of IAEA publications used as the reference for this mission is given in Appendix VIII.

C) CONDUCT OF THE REVIEW

An opening IRRS Review team meeting was conducted by the IRRS Team Leader and the IRRS IAEA Team Coordinator on Sunday 28 August 2014 in order to discuss the general overview, the focus areas and specific issues of the mission, to clarify the basis for the review and the background, context and objectives of the IRRS and to agree on the methodology for the review and the evaluation among all reviewers. They also presented the agenda for the mission.

The Liaison Officer, Dang Thanh Luong was present at the opening IRRS Review team meeting and presented logistical arrangements planned for the mission.

The reviewers also reported their first impressions of the advance reference material.

The IRRS entrance meeting was held on Monday, 29th September 2014, with the participation of VARANS senior management and staff, representatives from the Ministries of Science and Technology (MOST), EVN and VAEA (list of participants given in Appendix II). Opening remarks were made by Dang Thanh Luong on behalf of the Director General of VARANS and John Kinneman, IRRS Team Leader made remarks on behalf of the team.

Dang Thanh Luong presented an overview of the current situation, highlighting what has changed since the 2009 mission. He followed this with a presentation on progress made in developing the legal and regulatory infrastructure for the nuclear power programme.

During the mission, a review was conducted of progress made in implementing all recommendations and suggestions from the 2009 mission and the progress in developing the regulatory infrastructure to support the introduction of nuclear power in Viet Nam. The review was conducted through meetings, interviews and discussions.

The IRRS Review team performed its activities based on the mission programme given in Appendix II.

The IRRS exit meeting was held on Thursday 9 Oct 2014. The opening remarks at the exit meeting were presented by the Professor Doctor Vuong Huu Tan, Director General of VARANS followed by a presentation summarizing the results of the mission by John Kinneman, the IRRS Team Leader. Closing remarks were made by Mr Pil-Soo Hahn, IAEA, Director, Division of Radiation, Transport and Waste Safety. An IAEA press release was issued at the end of the mission.

1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES

LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

R1 **Recommendation:**

The Government should make legal provisions to clarify and strengthen regulatory independence within and across MOST, MOIT, and MONRE, to ensure there is clear separation between the functions of regulation and promotion or operation of radiation and nuclear activities.

In 2008, the Viet Nam National Assembly passed the Law on Atomic Energy which came into effect on 01 January 2009 and governs all activities in the field of atomic energy including the promotion and assurance of safety for those activities. As identified during the 2009 IRRS mission, while this Law prescribes the duties and responsibilities of VARANS[1], these are only limited to 'assisting' the Minister of Science and Technology in carrying out regulatory functions such as inspections, licensing and enforcement. The Law also stipulates that the Ministry of Science and Technology is responsible for establishing the programme for the development and application of atomic energy. For example, both VARANS and VINATOM, the operator of the research reactor, report to the same Minister who is therefore both responsible for operation of the reactor and the chief regulator. This arrangement does not conform to the IAEA safety requirements for independence of the regulatory decision-making.

The issues of independence of regulatory decision-making and coordination among involved entities become more complex with regard to the legal framework for regulating the proposed Nuclear Power Plants (NPP). According to the Law on Atomic Energy and Decree No. 70/2010/ND- CP, the Prime Minister approves the location of an NPP. MOST grants the construction licence after it has consulted MONRE and the National Nuclear Safety Council (NNSC). MOIT has the responsibility to issue the operating licence after consulting MOST and NNSC, although EVN, the NPP operator, is a State Company under the direct management of MOIT. The independence of regulatory decision making is therefore potentially compromised since there is no clear separation of promotional and regulatory activities within the same Ministry. Furthermore, the licensing responsibilities are fragmented between Ministries, which is a challenge for ensuring regulatory effectiveness.

The team noted that the revisions to the 2008 Atomic Energy law are undergoing consideration. In 2013, the Minister of Science and Technology set up, through an administrative Decision, a committee composed of 20 Representatives from several Ministries and organisations Ministry of Construction (MOC), Ministry of Natural Resources and Environment (MONRE), Ministry of Trade and Industry (MOIT), EVN, VARANS, etc. to review the law drafted by a working group under the leadership of MOST.

[1] The common practice in Vietnam is that no agency under a minister should be mandated in a law. VARANS is consequently designated in the Law on Atomic Energy as the "*national agency for radiation and nuclear safety*".

Given the points above, the team considers that, as a matter of high priority the current Law on Atomic Energy should be amended to address these issues of the independence, the reporting lines and the authority of the regulatory body to be in line with the IAEA Safety Standards and the Convention on Nuclear Safety[2] (see also Recommendations 10 and 69).

Recommendation 1 (R1): is OPEN

LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R2	**Recommendation:** The Government should ensure that VARANS has adequate staffing and financial resources to discharge their assigned responsibilities, both now and in the future.

Financial resources

The funding modality of VARANS has not changed since 2009. VARANS' financial resource comes from the government regular budget in accordance with the annual budget plan approved by the Minister of MOST and the Minister of Finance. VARANS may also use 85% of licensing fees for its activities.

Some trends are worth mentioning:

- new and convenient offices have been recently allocated to VARANS by MOST;
- the number of Staff of VARANS has increased since 2009;
- the budget of VARANS has increased, however less through the increase of its regular budget than through the yearly allocation by the MOST of extra-budgetary fund for specific needs. This extra-budgetary funding is for instance used for contracting with international consultants in relation with the safety assessment of the two first NPPs. Each project requires a lengthy approval process. This causes administrative costs and delay; and
- the technical independency of VARANS has increased through the upgrade of the staff of the three Technical centres, which work for VARANS as internal TSO. However, the safety review and assessment of the information provided by a foreign vendor and the supervision of the activities of EVN will remain a technical challenge in the near future. It will require additional qualified staff and the support by external advisory organisations or companies, which implies additional cost for VARANS.

[2] In 2010, Viet Nam became Party of the Convention on Nuclear Safety, which states in its article 8.2 that Contracting Parties shall *"take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body concerned with the promotion or utilization of nuclear energy".*

The activities of VARANS would consequently benefit from a transfer of the extra-budgetary funding into its regular budget to allow the organisation more flexibility for its multi-year allocation and budgeting. Sufficient and regular budgeting will further facilitate technical independence and will also be needed to cover the additional regulatory activities related to the new NPPs.

Human resources

Further efforts are needed to increase the number of staff of VARANS:

- as part of the development of a nuclear power programme in Viet Nam, which implies an increasing need for resources to review all stages of the licensing process of the Nuclear Power Plants; and
- to ensure that VARANS continue to discharge its responsibilities in all existing activities.

The team was particularly concerned by the very limited resources available for the inspection activities, which are a key function of a regulatory body according to the IAEA Safety Standards.

VARANS is the main State's agency in charge of inspecting the 800 'radiation facilities'[3], which they are responsible to authorize according to the Nuclear Law. According to the Circular N°08/2010/TT-BKHCN issued on 22 July 2010, these facilities are to be inspected at least once a year. VARANS, with 12 inspectors of which only 2 are permanent staff, is obviously understaffed to discharge its responsibilities in the field of inspection, as assigned by the regulation.

Moreover, the resources of VARANS for conducting inspection haven't been increased much since 2009 whereas the duties of the Inspection Division have consequently expanded, due to:

- the conduct of in-depth inspections on the research reactors of DALAT, following the related recommendations of the 2009 IRRS report;
- the increasing involvement of the division on the oversight of the siting process; and
- the significant work invested by the division in the drafting of procedures and guidance for inspection during the phase of construction of the Nuclear Power Plants.

Technical resources

Additional budget will have to be identified by the Government to address the human resources' challenges identified by VARANS concerning the training of the staff newly recruited:

- to increase the competency in the field of Nuclear safety; and

[3] The total number of licensee in Viet Nam is about 4000, among which 800 are considered as 'radiation facilities', as defined by the Law on Atomic Energy as : Operating accelerators, Conducting teletherapy, Conducting sterilisation irradiation, or irradiation for material treatment, Producing, processing radio-isotopes, National radioactive waste storage, facilities for storage, processing, or disposing of radioactive waste with radioactivity of 10.000 times higher than exemption level for notification. All facilities can be inspected by the 63 provincial DOSTs according to the legislation but, in practice, the 800 facilities licensed by VARANS are mainly inspected by VARANS inspectorate.

- to maintain and enhance the competency for the control of existing facilities in Viet Nam.

The regular budget of VARANS should be upgraded to answer its needs in the field of training.

Strategic planning for the future

The team was informed that VARANS is evaluating its future needs in terms of staff and financial resources, including for the coverage of training needs, and it will submit to the Minister of Science and Technology before the end of the year a 'Project' on human resources, which draws a strategy for staffing VARANS with adequate competences in the next years (cf. Chapter 3). VARANS has evaluated its specific needs for training in the field of nuclear safety and estimated its related costs to be 7 million dollars (150 million dollars should be allocated by the Government to cover the needs of all States agencies and organisations involved in the development of a nuclear power programme).

Recommendation 2 (R2) is OPEN

LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

R3 **Recommendation:**

The Ministry of Science and Technology should provide detailed regulations and guidelines on exemption levels for notification and licensing, clearance level, procedures for verification, appraisal, approval and measures for clearance of radioactive sources, radioactively contaminated objects, as required by Article 33 (k) of the Law on Atomic Energy.

Two Circulars have been adopted since the last IRRS Mission in 2009 following a graded approach:

- The MOST Circular N°15/2010 has been adopted on September 14, 2010 and has promulgated the National Technical Regulation QCVN 5:2010 – Radiation protection – Exemption from Notification and Licensing. This circular provides detailed guidelines on exemption levels for notification and licensing; and
- The MOST Circular 22/2014/TT-BKHCN dated 25 August 2014 on radioactive waste and disused sources provides in addition detailed clearance level and processes of radioactive waste and contamination.

These circulars properly answers to the provision mentioned in Article 33(k) of the Law on Atomic Energy.

Recommendation 3 (R3) is CLOSED

LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

R4 **Recommendation:**

A graded approach to authorization, inspection and enforcement should be incorporated into the legal structure.

Several regulations have been adopted since the last IRRS Mission in 2009:

- The MOST Circular N°15/2010 has been adopted on September 14, 2010 and has promulgated the National Technical Regulation QCVN 5:2010 – Radiation protection – Exemption from Notification and Licensing. This circular provides detailed guidelines on exemption levels for notification and licensing.
- The Circular N°08/2010/TT-BKHCN issued on 22 July 2010 guiding Notification, Issuance of Licenses and Radiation Worker Certificate. This Circular provides detailed guidance for submitting applications. 14 different dossiers are listed for all type of licenses to be issued, following a graded approach.
- The Circular N°19/2010 issued on 28 December 2010 on specializing inspections in radiation safety & control provides frequency of inspections in its Appendix 2. For instance the research reactors of DALAT should be inspected every year, an accelerator every year, Medical X-ray devices at least every 2 years etc.
- The Circular N°20/2013/TT-BKHCN issued on 6 September 2013 providing Process and Procedure of Regulatory Inspection on Nuclear Safety in Surveying and Evaluating an NPP.
- Decree N°107/2013/ND-CP on Sanctions against Administrative Violations in the Field of Nuclear Energy was issued on 20 September 2013. This Decree provides sanctions for every type of violations, following a graded approach (from limited fines for small violations to 1 million Vietnamese Dong for individuals using Nuclear Material or devices without authorization, or 2 million Vietnamese Dong for organisations committing the same violation.

These regulations address adequately the issue raised through the Recommendation R4 of the 2009 IRRS Mission.

Recommendation 4 (R4) is CLOSED

LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

R5 **Recommendation**

MOST should issue the Circular proposed by VARANS which specifies the procedures and formalities described in Articles 36(5) and 40(5)).

The Article 36(5) of the Law on Atomic Energy provides that "*The Ministry of Science and Technology shall specify procedures, formalities for verification and approval of plans for dismantlement, decontamination and handling of radioactive sources, radioactive waste*". The Article 40(5) of the Law on Atomic Energy provides that "*The Ministry of Science and Technology shall specify procedures, formalities of verification and approval of plan for decommissioning, decontamination, handling of nuclear fuel, nuclear equipment and radioactive waste*".

The MOST Circular 22/2014/TT-BKHCN dated 25 August 2014 on radioactive wastes and disused sources. This Circular provides requirements for implementing the principles of return of disused sources to their original supplier. If this return is not possible, the sources have to be conditioned and stored.

VARANS has planned to issue in addition a new circular on the decommissioning and dismantling of nuclear installation. This circular is planned to be drafted and published before 2020.

An addition circular is also needed to set the requirements for dismantling or decontamination of equipment or premises.

Recommendation 5 (R5) is OPEN

LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S1	**Suggestion:** VARANS should be involved in the development of the national strategy for research and development to improve safety and such research and development should be further expanded.

VARANS has set up over the past years some activities in the field of research, for example to evaluate the level of patient doses. Another project has been initiated by VARANS on severe accident Management with the organization VINATOM. VARANS can submit any proposal for a R&D project or program to the MOST, whose dedicated committee decides the allocation of funds. VINATOM is implementing its own programs and projects, independently from VARANS.

Additional activities include, for example:

- The strategy for peaceful uses of atomic energy up to 2020, issued with the Decision by Prime Minister No. 01/2006/QD-TT of 03 Jan 2006
- National Nuclear Safety Council was established to consult the government on the strategy related to nuclear and radiation safety
- Vietnam has a national project KC05 in which there are several sub-projects on developing the regulations and guides on nuclear and radiation safety and enhancing the technical capabilities.

No national strategy in the field of Nuclear and Radiation Safety has yet been established by the Government. The involvement of VARANS for the identification of priorities in the relevant fields by the dedicated MOST Committee could be increased in the future.

Suggestion 1 (S1) is OPEN

LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

S2 **Suggestion:**

Even though the legal basis for liabilities is in place, the proposed draft legal instrument to implement the requirements of the Law on Atomic Energy by Articles (90(2) & 91(3)) should be issued.

Article 87 to 91 from the Atomic Energy law give general provisions for the civil nuclear liability in Viet Nam for organizations or individuals conducting radiation practices, as defined by the law.

Article 90 deals with insurance policies. The circular N°13/2012/TT-BTC providing "Compulsory Professional Insurance, Civil Liability Insurance and Environmental Damage Compensation Liability Insurance applicable to Organizations and Individuals performing Radiation Practices" implements the requirements provided in article 90(2) of the law.

Article 91 deals with the creation of a support fund for damage compensation, in case the organization or individuals responsible for damage compensation no longer exist or if the amount of the damage is higher than the amount specified in article 87 of the law. The requirements provided in Article 91(3) have not been addressed, as the article should be subject to modifications in the next amendment of the Law on Atomic Energy.

The IAEA action plan on nuclear safety[4] as well as the IAEA resolution GC(58)/RES/10 dated September 2014[5] both encourage IAEA Member States to give due consideration to the possibility of joining the international nuclear liability instruments.

The team noted in that regard that Viet Nam is considering adhering to the 1997 Vienna Convention on Civil Liability for Nuclear Damage. VARANS already suggests some amendments in the law on Atomic Energy to upgrade the provisions of the Vietnamese legislation in accordance to the provisions of the 1997 revised convention and to take into account the recommendations by the IAEA INLEX group and by the IAEA/OLA assistance missions.

[4] "Member States to give due consideration to the possibility of joining the international nuclear liability instruments as a step toward achieving such a global regime"

[5] 23. Encourages Member States to work towards establishing a global nuclear liability regime and, as appropriate, to give due consideration to the possibility of joining the international nuclear liability instruments.

Suggestion 2 (S2) is OPEN

2. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S3	**Suggestion:** The "prime responsibility for safety of the operator" principle, addressed in article 6 of the Law on Atomic Energy, should be more developed and explained in further regulation.

The principle of "operator's prime responsibility for safety" is not properly addressed in the Law on Atomic Energy. However, this principle has been addressed by implementing regulatory documents.

It should be considered if the principle of "prime responsibility of the operator", which is in line with the IAEA safety standards, can be included among the future amendments to the draft Law on Atomic Energy.

To achieve more comprehensive understanding of this principle, provisions of the future amended Law on Atomic Energy should further clarify that compliance with the requirements imposed by the regulatory body shall not relieve the operator of its prime responsibility for safety. In particular, this prime responsibility implies that this responsibility cannot be transferred to subcontractors or a third party.

Suggestion 3 (S3) is OPEN

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S4	**Suggestion:** VARANS should expand its communication and information policies and report to other governmental bodies and to the public on the safety aspects (including health and environmental aspects) of facilities and activities and on its regulatory processes.

Significant progress have been made since 2009 as regards VARANS' communication and information policies and reports to other governmental bodies and to the public on the safety aspects: Since 2014 VARANS has started issuing a "Nuclear Regulatory Bulletin", which is

available on its website, as well as the booklet was distributed to all relevant governmental and other organizations. VARANS conducts the following communication activities:

- VARANS continues developing its website;
- VARANS organizes an annual meeting for radiation protection officers;
- VARANS publishes an annual report, which comprises organizational and personal issues, development of legislation, licensing, inspection, radiation protection, nuclear safety and security, safeguards, radioactive waste management, etc. This report is sent to the Minister of Science and Technologies, to the DOSTs and other interested Parties;
- The MOST organizes one day public hearing every month, where the public can ask questions or provides feedback on VARANS' activity. In such cases, VARANS is asked by the MOST to provide answers;
- VARANS receives regularly questions asked by representatives of the National Assembly through the MOST.

In spite of this progress VARANS should consider creating a requirement:

- to send the Annual Report to the National Assembly and to the Government;
- to inform the public about the regulatory activities of nuclear and radiation safety in Viet Nam.

Suggestion 4 (S4) is OPEN

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S5	**Suggestion:** MOST should keep the Government informed about the safety aspects of the DALAT research reactor, due to the role played by the reactor in the supply of radioisotopes for Viet Nam.

There is not a reliable source of information or a regulatory requirement which would provide prompt information to the Government regarding safety aspects of the Dalat research reactor that may result in a longer shutdown of the reactor. See also suggestion S7 (notification of events) and the chapter on inspection.

Suggestion 5 (S5) is OPEN

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R6	**Recommendation:** VARANS should identify all areas where it has to cooperate with other relevant authorities.

VARANS recognizes a need for co-operation with other relevant authorities and about advising them and providing them with information on safety matters, if necessary. VARANS has identified the following areas of co-operation: environmental protection (MONRE), public and occupational health (MOH), emergency planning and preparedness (MOD), radioactive waste, physical protection (MOI), water use and consumption of food (MOA).

This cooperation with the relevant Ministers is well addressed by VARANS in practice but still needs to be documented through memoranda of understanding with relevant Ministers

Since this recommendation is similar to Suggestion 6 (the Government should develop a document to clarify the required roles and responsibilities for the co-operation of VARANS with other relevant authorities) and to Recommendation 12 (the Government should ensure that various regulatory authorities co-ordinate their regulatory activities at the national level), the issuance of document required by Recommendation 12 would also satisfy Recommendation 6. Therefore, R6 is closed, while Recommendation 12 remains open.

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S6	**Suggestion:** The Government should develop a regulation or an administrative instruction for these areas to clarify the roles and responsibilities, and facilitate more direct communication.

The Government has not yet developed a regulation or an administrative instruction which would clarify the roles and responsibilities for the areas of cooperation listed in Recommendation 6.

Suggestion 6 (S6) is OPEN

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S7	**Suggestion:** A regulation should be issued to: - put a process in place for notification of abnormal events, incidents or accidents according to criteria defining the severity of the event; - establish a time limit for notification considering these criteria; - establish a requirement for the operator to report on the events occurring, to the regulatory body within a specified period of time, depending on their severity; - facilitate dissemination.

The required regulation to put a process in place for notification of abnormal events, incidents or accidents according to criteria defining the severity of the event and defining a time limit for notification has not yet been published.

The VARANS has developed a draft Ministerial Circular on preparedness and response for radiological and nuclear incidents, which is planned to be issued by the Minister of MOST in 2014. This Circular sets forth criteria for notification of incidents and accidents. However, the draft does not define events considered significant to safety that should be notified to the regulatory body. Clearly defined reporting criteria, periods and format are indispensable input for effective operational experience analysis and feedback. VARANS should consider developing broader criteria for those events which shall be reported to the regulatory body, as well as defining how rapidly the different types of events and an event analysis is to be sent to the regulatory body.

Suggestion 7 (S7) is OPEN

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R7	**Recommendation:** VARANS and MOST should cooperate with other relevant governmental bodies to issue a national strategy plan for a sustainable management of radioactive wastes, which defines aims and needs. This plan should appraise the existing management modes of radioactive wastes, identify the foreseeable needs for storage or disposal installations, provide for the implementation of research and studies on the management of radioactive wastes and define roles and responsibilities between State Agencies and Ministries.

A draft "Governmental Decree on National Policy and National Strategy for the Management of Radioactive Waste and Nuclear Spent Fuel" has been prepared by VINATOM and it is planned to be approved in 2015.

This document consists of two parts: the policy and the strategy. In the strategy there is, inter alia, implementation of the policy, principles of radioactive waste management, financial aspects, as well as approaches for different types of radioactive waste. The strategy foresees:
- For high level waste a solution will be sought after at least 30 years;
- NORM and TNORM will be stored/disposed on-site; and
- Establishment of an organization for radioactive waste management, which will operate the central radioactive waste disposal facility(ies).

Currently radioactive waste from DALAT research reactor is stored at the interim storage on-site. There is a project to remove all disused radioactive sources, which are stored at licensees, to temporary radioactive waste storages located in the country.

However, the Prime Minister issued the Decision No. 2376/QD-TTG approving the "Orientation for Planning Storage and Repository of Radioactive Waste through 2030, with the Visibility through 2050" on 28.12.2010. This decision comprises the following important chapters:

- Objectives,
- Criteria for selection of sites for RW storage/disposal,
- Classification of RW,
- Methods of RW storage,
- Forecast of RW volume which may be produced (2011-2020, 2020-2030, 2030-2050),
- Area of national sites for RW storage, disposal (2011-2020, 2020-2050),
- National sites for RW storage, disposal,
- Roadmap (2011-2015, 2015-2020, 2020-2030, 2030-2050),
- Responsibilities of MOC (Ministry of Construction), MOST, MONRE, MOIT and Provincial Authorities.

The above document was used as the input for the national strategy plan for a sustainable management of radioactive wastes.

This Recommendation can be related to R63, which requires that VARANS should expedite developing the Circular regarding radioactive waste management, including management of disused sources. This Circular No. 22/2014 has been issued and should become a part of the national strategy plan for a sustainable management of radioactive wastes (see also recommendation 84).

Recommendation 7 (R7) is OPEN

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R8	**Recommendation:** VARANS should takes steps to satisfy themselves that the work of their Technical Support Centre does not lead to conflicts of interest, especially when advice is provided to licencees.

The VARANS' Technical Support Centre may perform work for the licensees, because they cannot find a competent organization to perform that job in the domestic market (e.g. shielding calculation, some radiation measurements). This could lead to conflict of interests and VARANS has not yet taken steps to avoid this conflict.

Recommendation 8 (R8) is OPEN

RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R9	**Recommendation:** The Government should conduct a review to determine other places in the regulatory body where there may be conflicts of interest as a result of technical support services, and take action to avoid the conflict.

The Government has not yet conducted a review to determine, if there are other areas in VARANS where there may be conflict of interests as a result of technical support services and take measures to avoid this conflict.

As regards the Technical Support Centre and within other entities of VARANS there are not any such conflicts. However, there may be such a conflict, if VARANS hires subcontractors (external consultants), which may simultaneously work for the licensee(s). Further work is needed to avoid any conflict of interests in the field of expertise services (see recommendation 1 and suggestion 8):

- For establishing a procedure on contracting with other organizations or companies providing technical supports, in order to prevent conflict of interest; and
- For clarifying the organization of VINATOM to ensure an independence of the expertise support provided to VARANS with the expertise support provided to the future operator EVN.

Recommendation 9 (R9) is OPEN

3. ORGANIZATION OF THE REGULATORY BODY

ORGANIZATION OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R10	**Recommendation:** MOST should ensure that the reporting lines of its bodies charged with regulatory functions preserve the independence of regulatory decision making from those bodies charged with promotional activities. The same principle should be applied to other relevant Ministries involved in regulatory activities.

Under the current legislation, VARANS is required to report mainly to the Ministry of Science and Technology, which takes the regulatory decisions, on Nuclear and Radiation safety issues[6].

The draft amendment of the Law on Atomic Energy law being considered contains an amended provision under which the regulatory body shall report to the Minister of Science and Technology for usual issues and directly to the Prime Minister for significant Nuclear Safety issues. VARANS mentioned that an additional reporting line to the national assembly is being also considered by the drafter of the amendment.

In the field of nuclear safety, VARANS is also required to report on its work to a National Council for Nuclear Safety, which is the basis for recommendation 11. This line of reporting is not planned to be changed during amendments currently under consideration.

This draft amendment should be carefully reviewed by the Government, as suggested in chapter 1 of this report, to ensure that the recommendation 10 is taken into account.

Recommendation 10 (R10) is OPEN

ORGANIZATION OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R11	**Recommendation:** The Government should ensure that the National Council for Nuclear Safety, when advising the Prime Minister and when reviewing and assessing reports made by VARANS, does not relieve VARANS of its responsibility for making decisions and recommendations.

A National Council for Nuclear Safety has been established pursuant to article 9 of the 2008 Law on Atomic Energy[7]. This Council is described by the law as a body to advise the Prime Minister, which has the responsibility:

[6] The Department of Science and Technologies, which are responsible to issue licenses for X-Ray medical devices, report to the provincial committees;.

- *"to provide advice to the Prime Minister on strategy and measures to ensure the safety for atomic energy utilisation and operation of nuclear power plants, and measures to respond to severe nuclear accidents*".
- "*to review and assess verification reports made by the agency for radiation and nuclear safety on the safety of nuclear power plants*"[8].

The second assigned responsibility is a matter of concern by the team for the following reasons:

a) The Council membership includes bodies such as VINATOM which could unduly influence the regulatory decision making process.

In the composition of the Council, VARANS and VINATOM are equally represented by 2 representatives each. Taking into account that VINATOM will provide technical support to EVN to write the safety reports which are assessed by VARANS, the Council will most probably have to discuss disagreements between the licensee and VARANS. In such cases, the other Members, being the Minister of Science and Technology and high level representatives of Ministries (Vice-Ministers), will have to decide recommendation following a majority rule. If the Council disagrees with VARANS' review of the safety assessment or recommended actions, VARANS may be requested by MOST to submit a new review report.

b) The Council might result in a dilution of the regulatory responsibilities.

The scientific council issues recommendations on different general topics in the field of nuclear safety, like education and training, but also on Safety assessments submitted by VARANS which are provided to support regulatory decisions.

These decisions, which can be taken by different authorities, depending on the specific decision to be made[9], will be based both on the VARANS safety assessments endorsed by the Minister of Science and Technology and on the recommendations of the National Nuclear Safety Council provided to the Prime Minister. The possibility of conflicting recommendations from a very influential, but not very technical, National Safety Council might result in a dilution of the regulatory responsibility of VARANS in the field of Nuclear Safety.

The Government should take the opportunity of the next amendment of the Law on Atomic Energy to ensure that the regulatory decision making process takes due account of scientific knowledge and expertise, free from any undue influences that might compromise safety. In that regard, recommendation 11 still needs to be addressed. Suggestion 8, that comments on the integration of the advice of external scientific committees into VARANS' decision-making, is also linked to this issue.

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[7] In compliance with Article 9.3 of the law, an additional decision on the establishment of the council has been taken by the Prime Minister on 7. April 2010 (N°446/QD-TTg).

[8] In addition, a decision on the establishment of the council has been taken by the Prime Minister on 7 April 2010 (N°446/QD-TTg), in compliance with Article 9.3 of the law on Atomic Energy.

[9] Decision on siting is taken by the Prime Minister, Decision on the construction of the NPP is taken by the Minister of Science and Technology, Decision on the operation of the NPP is taken by the Minister of Industry and Trade.

Recommendation 11 (R11) is OPEN

ORGANIZATION OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R12	**Recommendation:** The Government should ensure that the various regulatory authorities appropriately coordinate their regulatory activities at the national level, including the relevant Councils of the Prime Minister, and also at the provincial level.

The Atomic Energy Law assigns regulatory responsibilities to different bodies, for instance:

- VARANS is responsible to draft the regulation;
- VARANS is responsible to carry out inspections and to implement enforcement actions for all existing nuclear energy activities in Viet Nam;
- VARANS is responsible to receive registration for or to license all of them except X-ray equipment used for medical diagnosis;
- The 63 Departments of Science and Technology (DOSTs) are in charge of licensing X-Ray equipment used in medical diagnosis;
- The Ministry of Natural Resources and Environment licenses for exploring, mining, milling, processing radioactive ores;
- The Ministry of Industry and Commerce issues licenses for operating nuclear power plants after obtaining consensus with the Ministry of Science and Technology and the National Nuclear Safety Committee; and
- The Ministry of Health has some regulatory role in of the preparation of regulations and guides in the medical are and in the field of import of irradiated or radioactive consumer products.

Since 2009, the coordination between all these bodies has significantly been improved.

Coordination with the DOSTs is now ensured through the following arrangements:

- Inspectors from the DOST's are trained by VARANS' inspectors during a training course organized by the MOST inspectorate once a year;
- VARANS convenes all DOST's staff to a meeting every year in a different province to inform them on the implementation of the recently adopted radiation safety regulation, and more generally to improve the cooperation;
- All DOST's are requested through a letter sent every year by the VARANS DG to submit a yearly report on their licensing activity and a yearly report on their inspection activity. However, this practice needs to be formalized, at least in the management system of VARANS;
- DOSTS' inspectors are invited to join inspections performed by VARANS;
- The establishment of a VARANS "*Technical Support for Radiation Center*" in Ho Chi Minh city, has improved the support provided to the DOSTs located in South provinces, while reducing the costs of travel for VARANS' experts; and

- DOST's are place legally under the supervision of Peoples Provincial Committees. However, a circular adopted in 2010 (19/2010) has increased the obligation of direct reporting to VARANS. For instance, if an incident is being reported, the Circular requests the relevant DOST to perform an inspection within 3 days and to report to VARANS on the conclusions of the inspection before 5 days after the report of the incident.

Coordination with the MONRE is provided through the following arrangements:

- According to the Law on Atomic Energy, the relevant licenses are issued by MONRE "based on" safety assessments established by VARANS ;
- MONRE inspectors sometimes invite DOSTs' inspectors for joint inspections. However, this practice is essentially based on practices of individuals and should be documented in a memorandum between MONRE and VARANS.

Coordination with the Ministry of Health is ensured through the following arrangements:

- VARANS invites representatives of the Ministry of Health when performing inspections at medical facilities. A copy of VARANS' inspection report is provided to the Ministry of Health. However, this practice is not covered by a memorandum of understanding between the Ministry and VARANS.

Concerning the nuclear power program, a mechanism has been implemented to provide for the coordination between all Ministries involved in the licensing process:

- The Decision by the Prime Minister No. 580/QD-TTg, published on 4 May 2010, establishes a "State Steering Committee for the Ninh Thuan Nuclear Power Project". This Steering Committee is tasked to "direct the implementation" of the NPP Project. This Steering Committee deals with the coordination of all governmental processes of the Nuclear Power Program, including the promotional one and the nuclear safety related activities.

- The Decision by the Prime Minister "*promulgating the Regulation on the Operation of the State Steering Committee for the Ninh Thuan Nuclear Power Project*", published on 17 January 2011, details the composition and organisation of the Steering Committee. The Committee, which is required to meet every 6 months, is chaired by the Vice Prime Minister and includes Vice-Ministers from all relevant Ministries.

- The Steering Committee has decided to establish a sub-committee tasked to deal only with the coordination of the different procedures relevant to Nuclear Safety and Nuclear Security. This Subcommittee is chaired by the Vice-Minister of Science and Technology and includes representatives of VARANS.

These developments address a large part of the recommendation R12. However, VARANS agrees with the team that further important actions need to be taken:

- Some existing coordination practices will have to be formalised in the future in the VARANS management system and possibly memorandums between VARANS and other organisations having regulatory responsibilities in the field of radiation safety;

- The effectiveness of the authorization processes for the NPP programme is a real challenge to implement effectively, due to the number of organizations required to make regulatory decisions in Viet Nam. The effectiveness of the process recently established to coordinate the different organisations having responsibilities in the licensing process of the Nuclear Power Program should be reviewed in the future. This coordination should not be limited to the licensing process. Inspection during all stages of the Nuclear Power Plant construction and operation will require a very complex coordination between all Ministries involved and VARANS, to ensure both consistency in the process and the availability of the required competences during the inspections. (see recommendation 67).

Recommendation 12 (R12) is OPEN

ORGANIZATION OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S8	**Suggestion:** In those areas in which VARANS is not entirely self-sufficient, mechanisms and resources should be provided for VARANS to use external services. Accordingly, they should develop criteria for authorization of external consultants and ensure their independence from the operator.

VARANS had established some years ago a "Scientific Committee" within VARANS, composed by external experts in charge of issuing recommendations on important safety issues or on safety analysis report submitted by VARANS. This Scientific Committee has however not been renewed since many years. According to the MOST circular n°217 issued in February 2014, the DG of VARANS can establish advisory bodies and the new DG is considering to establish again an advisory "Scientific Committee" on this basis. If the decision is made, it could be advisable for VARANS to consider appointing foreign experts in this committee to get external view on its safety reviews.

VARANS is still requesting the assistance from external domestic TSOs when dealing with complex technical issues. No organisational measures have been put in place to ensure an independence of the expertise provided to VARANS with the expertise provided to the future operator EVN (see chapter 1 of this report).

VARANS now regularly makes use of external private contractors to assist the regulatory body when assessing nuclear safety issues. To ensure the independence of the expertise from any undue influence or conflict interest that might compromise safety, VARANS is drafting terms of reference to be integrated to the contracts with external technical support organisations or companies.

Suggestion 8 (S8) is OPEN

ORGANIZATION OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

ORGANIZATION OF THE REGULATORY BODY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S9	**Suggestion:** Thorough analysis of staffing and qualification needs should be done and this should be reflected in a VARANS management document. The staffing and competence issues should be systematically addressed regularly at least once a year and corrective actions should be adopted.
S10	**Suggestion:** VARANS should establish a training programme for its staff on an annual basis paying attention that new staff receives adequate training and address the areas where there is a lack of expertise, e.g. establish on the job training in medical area for inspectors.
R13	**Recommendation:** The regulatory body should be provided with the necessary staff with the necessary skills to meet its statutory responsibilities, including staff who are capable of performing safety assessments for the scope of radiation/nuclear infrastructure which exists in the country.

VARANS is developing a comprehensive "Human Resources "Project", to be submitted to the Minister of Science and Technology. This project is aiming at compiling all the needs in terms of number of staff and competencies related to the nuclear power programme. The final document should be finalized before the end of 2014 to be presented to the Minister of Science and Technology, in order to request the corresponding budget. The project document should be updated every year to justify the budget yearly requests. However, this Human Resources Project doesn't cover regulatory functions related to all existing facilities and activities.

The document requests an increase of staff to 115 by 2015 and 250 by 2020, on the basis of an assessment of the work to be carried out in the next years, in particular with the development of a nuclear power programme. Given the large planned expansion of its staff VARANS should ensure an evaluation of the training needed is incorporated in the strategy document.

The Government has increased the number of staff of VARANS, from 63 staff in 2009 to 95 in 2014. However, with the planned transition to "phase 3" of the Nuclear Programme with a call for bids, additional efforts should be continued and even reinforced to provide VARANS with the necessary skilled staff to meet its statutory responsibilities, in particular to perform safety assessments.

Suggestion 28 and Suggestion 59 also deals with training programmes.

Suggestion 9, Suggestion 10 (S9 and S10) and Recommendation 13 (R13) are OPEN

4. ACTIVITIES OF THE REGULATORY BODY

Authorization of Industrial and Research Facilities and Activities

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R14	**Recommendation:** Activities of possession, ownership and transfer should be included in the detailed technical regulations.

Requirements associated with the possession, ownership, and transfer of radioactive materials at industrial and research facilities have been included in a number of Circulars that were issued following the IRRS mission in 2009:

- Circular No. 08/2010/TT-BKHCN, "Guiding the Notification and Licensing of Radiation Practices and Granting of Radiation Worker Certificates," dated July 22, 2010, provides guidance associated with notification and licensing activities using radioactivity.

- Circular No. 15/2010/TT-BKHCN, "National Technical Regulation on Radiation Protection – Exemption from Requirements of Notification and Licensing," dated September 14, 2010, provides guidance associated with the Exemption concept, as defined in the IAEA safety standards RS-G-1.7.

- Circular No. 02/2011/TT-BKHCN, "Guiding and Performing Control of Nuclear Materials," dated March 16, 2011, provides guidance on the processing, accounting, auditing, and enforcement.

According to these regulations, the transfer of radioactive sources cannot be undertaken before the receiver of the source is duly authorized to possess and to use it. In addition, every transport of radioactive sealed sources in Viet Nam are subject to authorization by VARANS (except for mobile sources, where the transport authorization is included in the authorization of use the source).

Recommendation 14 (R14) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R15	**Recommendation:** VARANS should improve their procedures for the handling and assessment

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	of applications for registration certificate, license for radiation related practice. This should include technical criteria for detailed demonstration of safety.

VARANS informed the Team that internal Procedure QT.08, "Procedure for Licensing and Radiation Certificate for Radiation Workers," dated May 10, 2013; and QT.10, "Procedure for Assessing," dated May 10, 2013, provides specific guidance for the VARANS staff for the review of applications concerning the possession and use of radioactive materials. This review process includes guidance for:

- checking that the application contains all required documents,
- appointing a reviewer of the application,
- requesting assistance from a VARANS Technical Support Centre, if necessary,
- requesting additional information to complete the review, if necessary, and
- issuance of the final letter summarizing the review results.

Recommendation 15 (R15) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S11	**Suggestion:** VARANS should evaluate the use of RAIS 3.1 Web rather than developing its own version of RAIS to support web-based authorization.

VARANS informed the Team that RAIS 3.1 was evaluated for use as an alternative to RAISVN for web-based licensing and that because RAISVN is based on RAIS 3.1 there are no plans to transition to RAIS 3.1.

Suggestion 11 (S11) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R16	**Recommendation:** The requirement for authorization of radiation-related practices should be commensurate with the potential magnitude and nature of the hazard presented by the radiation facility and practice. Several discrete stages of authorization should be considered for other practices, not only nuclear facilities.

Article 35, "Safety Analysis Report and Safety Assessment Report of Radiation Facilities," of the Law on Atomic Energy No. 18/2008-QH12 establishes requirements for the authorization of industrial and research facilities. In particular, Article 35 requires the development and submittal of a safety analysis report as part of the license application process for research facilities. Similarly, Article 41, "Construction and Operation of Nuclear Research Reactors," specifies the documents to be included in the authorization of a research reactor, including a safety analysis report. For research facilities and research reactors separate licenses (e.g. construction, commissioning, decommissioning) are issued at each discrete stage in the lifecycle of the research reactor and research facility.

Additional guidance to the operator on the format and content of documents to be submitted in support of an application for authorization has been issued in Appendix III and Appendix V of Circular No. 05/2006/TT-BKHCN dated January 11, 2006.

Recommendation 16 (R16) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R17	**Recommendation:** VARANS should develop clearly defined procedures for any subsequent amendment, renewal, suspension or revocation of an authorization. This should include technical criteria for detailed demonstration of safety.

Chapter V, "Extension, Modification and Re-Granting of Licenses and Re-Granting of Radiation Worker Certificates," of Circular No. 08/2010/TT-BKHC, "Guiding the Notification and Licensing of Radiation Practices, and Granting of Radiation Worker Certificates," dated July 22, 2010 includes detailed provisions for the amendment and renewal of an industrial or research facility authorization. Provisions for the suspension or revocation of an authorization are included in Article 79 of the Law on Atomic Energy No. 18/2008-QH12.

Recommendation 17 (R17) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: ATHORIZATION OF MEDICAL FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R18	**Recommendation:** A graded approach should be implemented for the authorization of radiological medical practices.

Joint Circular No. 13/2014/TTLT-BKHCNMT-BYT, "Ensuring Safety in Medical Applications," dated June 9, 2014, established a graded approach in the authorization of radiological medical practices based upon the inherent risks and hazards associated with the application.

Recommendation 18 (R18) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: ATHORIZATION OF MEDICAL FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S12	**Suggestion:** To facilitate the graded approach to licensing, medical practices could be considered to be four distinct areas: Radiotherapy, Nuclear medicine, Interventional radiology and Diagnostic radiology. These four areas could then be further subdivided according to the relative risk.

Article 4 of Circular No. 13/2014/TTLT-BKHCNMT-BYT, "Ensuring Safety in Medical Applications," dated June 9, 2014, specified a graded approach to the licensing of medical practices through the identification of the distinct areas of radiotherapy, nuclear medicine, and diagnostic therapy. These areas were further sub-grouped according to the relative risk of the activity. For example, activities in the area of x-ray diagnostics were sub-grouped in Article 5 of Circular No. 13/2014/TTLT-BKHCNMT-BYT according to the specific type of treatment (e.g. dental, mammography, interventional, etc.). Similarly, activities in the area of radiotherapy were sub-grouped in Article 6 of Circular No. 13/2014/TTLT-BKHCNMT-BYT according to the specific type of treatment (brachytherapy and cobalt therapy).

Suggestion 12 (S12) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R19	**Recommendation**: MOST and VARANS should establish a formal procedure determining which medical practices will be licensed by MOST and which will be licensed by VARANS.

Article 23 of Circular No. 08/2010/TT-BKHC, "*Guiding the Notification and Licensing of Radiation Practices, and Granting of Radiation Worker Certificates*," dated July 22, 2010 identifies the medical activities to be licensed by the Ministry of Science and Technology (MOST), the medical practices to be licensed by VARANS, and the medical practices to be licensed by the Departments of Science and Technology (DOSTs) in the provinces.

The issues related to the certification for medical physicists is covered by recommendation 40.

Recommendation 19 (R19) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R20	**Recommendation:** VARANS should develop a set of detailed regulations, clearly defined procedures and guidance documents to establish a comprehensive process to issue, amend and revoke authorizations for nuclear facilities. The regulation process should ensure that all aspects of safety, including limitation of releases of radioactive material in the environment and environmental monitoring, are covered.

The team reviewed this recommendation as it applies to nuclear facilities up to and including research reactors. Additional consideration may be required for nuclear power plant facilities.

Viet Nam is currently engaged in a joint project with Russia to develop a new research reactor, with Russia providing the design for the research reactor and financing for the project.

Currently, no site has been selected for the new research reactor in the process for site selection is ongoing. At this time, VARANS is participating in the review of a draft circular that was developed by VINATOM. VINATOM started preparation of the initial draft last year and used IAEA references as well as information from the US NRC as the basis for setting up the criteria for site selection. VARANS is reviewing this document and should complete the review within the next six months. VARANS will then be responsible for finalizing the circular and submitting it to the Minister of MOST for approval. Consideration should be

given to benefiting from the work already conducted from the siting of the nuclear power plant and adopt the applicable elements from those requirements.

Despite a projected operation date of 2020, no regulations on siting, design, construction, commissioning, operation and decommissioning are in place for research reactors. VARANS is preparing circulars on regulating research reactors.

Recommendation 20 (R20) is OPEN

ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R21	**Recommendation:** The regulation should provide criteria to define the modifications of nuclear facilities subjected to a review and assessment and to authorization by the regulatory body, with the potential magnitude and nature of the associated hazard being taken into account.

Pursuant to article 37(2) of the Law of Atomic Energy, any modifications to the research reactor must comply with national technical standards. Although significant changes to the research reactor are very rare, such changes require approval from the Minister of MOST. In such circumstances, the research reactor, operated by VINATOM, will make an application to MOST. VARANS will review this application and make a recommendation regarding approval to the Minister.

However, there are no criteria for defining the modification level for a research reactor which would initiate this process. In other words, there is no quantification of the significance of the change that is required to initiate the approval process. Furthermore, VARANS staff have no pre-established criteria for evaluating the application for approval. Although they can rely on technical support from the TSO, there is no mechanism by which the evaluation is considered. Development of criteria to assess the significance of a proposed change should be developed. Furthermore, any change which could alter the conclusions of the Safety Assessment Report should, as a minimum, be considered a significant change, requiring the approval process to be used.

Recommendation 21 (R21) is OPEN

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R22	**Recommendation:** Well defined procedures for industrial and research facilities and activities should be developed by VARANS to ensure that review and assessment is performed in accordance with potential magnitude and nature of the hazard of the practice. These procedures should state and make available to the operator the principles and associated criteria on which decisions are based.

VARANS informed the Team that internal Procedure QT.08, "Procedure for Licensing and Radiation Certificate for Radiation Workers," dated May 10, 2013 and QT.10, "Procedure for Assessing," dated May 10, 2013 provided specific guidance for the VARANS staff for the review of applications concerning industrial and research facilities. This review process includes a check to ensure the application contains all required documents, the appointment of a reviewer to review the application, performance of the review itself including requesting assistance from the Technical Support Organization (TSO) if necessary, the request for additional information if necessary to complete the review, and issuance of the final letter summarizing the review results.

Recommendation 22 (R22) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R23	**Recommendation:** VARANS should develop procedures for industrial and research facilities and activities to ensure that safety related modifications are subject to review and assessment commensurate with the potential magnitude and nature of the hazard presented.

VARANS informed the Team that internal Procedure QT.08, "Procedure for Licensing and Radiation Certificate for Radiation Workers," dated May 10, 2013 and QT.10, "Procedure for Assessing," dated May 10, 2013 provided specific guidance for the VARANS staff for the review of safety-related modifications at industrial and research facilities. This review process includes the appointment of a reviewer to review the modification and performance of the review itself including requesting assistance from the Technical Support Organization (TSO) if necessary, the request for additional information if necessary to complete the review, and issuance of the final letter summarizing the review results.

Recommendation 23 (R23) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R24	**Recommendation:** The review and assessment process should be based on a graded approach i.e.: one that takes into consideration the potential magnitude and nature of the hazard, and for medical practices the processes should include specific considerations for the protection of patients.

VARANS informed the Team that although a review and assessment of medical facility activities by VARANS is performed, formal procedures for these reviews and assessments based on a graded approach that considers the potential magnitude and nature of the hazard and that includes special considerations for the protection of patients have yet to be developed. VARANS informed the Team that for the reviews performed, professional judgment to determine the overall scope and detail of the review is exercised. In particular, the VARANS staff informed the Team that the potential magnitude and nature of the hazard, combined with the overall quality and content of the application submitted was a determining factor in the decision to schedule a site visit prior to issuing an application decision.

Recommendation 24 (R24) is OPEN

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R25	**Recommendation:** VARANS should define a review and assessment process taking into account the different stages e.g. the design, construction, commissioning, operation and decommissioning of research reactor.

VARANS informed the Team that a formal procedure for the review and assessment of research reactor activities that take into account all of the stages in the lifecycle of the facility (e.g. design, construction, commissioning, operation, and decommissioning) have yet to be developed. The VARANS staff also expressed the view that safety requirements being developed at a higher priority to support the design, construction, and operation of a nuclear power plant will accelerate the development of formal procedures associated with the review and assessment of research reactor activities.

Recommendation 25 (R25) is OPEN

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R26	**Recommendation:** VARANS should develop detailed documents specifying the principles and associated criteria on which judgment and regulatory decisions are made for research reactor and make them available to the operators.

VARANS in collaboration with Vinatom has been preparing circulars for research reactors, including: the Circular on guiding on licensing processes of site approval and construction license (planned to be issued by 2015); Circular on format and contents of SAR for research reactors (planned to be issued by 2015); Circular on requirements on safety design of research reactors (planned to be issued by 2015); and Circular on guiding on licensing processes of commissioning and operation license (planned to be issued by 2016). Principles and associated criteria on which judgment and regulatory decisions are made for research reactor will be defined in these regulations

Recommendation 26 (R26) is OPEN

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R27	**Recommendation:** VARANS should develop capacity for review and assessment of technical submission to determine whether the research reactor complies with the relevant safety objectives, principles and criteria.

VARANS informed the Team that actions are being taken to develop capacity for reviewing and assessing technical submissions to determine whether the research reactor complies with the relevant safety objectives, principles, and criteria . This technical competency is being gained during the course of designing, constructing, and operating a commercial nuclear power reactor, which is in progress and is currently being given a higher priority (noting that these skills will apply to similar activities associated with the research reactor).

Recommendation 27 (R27) is OPEN

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R28	**Recommendation:** VARANS should develop a detailed programme for review and assessment of research reactor facility so as to follow the development of research reactor from initial selection of site through design, construction, commissioning and operation, to decommissioning and closure.

VARANS informed the Team that a formal program for the review and assessment of the research reactor facility that takes into account all of the stages in the lifecycle of the facility (e.g. design, construction, commissioning, operation, and decommissioning) have yet to be developed. The VARANS staff also expressed the view that programs being developed to support the design, construction, and operation of a nuclear power plant, and that are currently being given a higher priority, will accelerate the development of a formal program for the review and assessment of research reactor activities that takes into account the entire lifecycle of the facility.

Recommendation 28 (R28) is OPEN

ACTIVITIES OF THE REGULATORY BODY: REVIEW AND ASSESSMENT OF RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R29	**Recommendation:** VARANS should define the modification process in the review and assessment so that any modification to safety related aspects of research reactor shall be subjected to thorough review and assessment, taking into account the potential magnitude and nature of associated hazard.

VARANS informed the Team that although the review and assessment of safety-related modification activities associated with core conversion and I&C change of the Dalat research reactor was performed, formal procedures for these reviews and assessments have yet to be developed. VARANS also informed the Team that when a review of safety-related modification activities at the research reactor is performed, the expertise of the Technical Support Organization (TSO) is frequently sought out to ensure that the safety-related modification is properly reviewed and assessed for approval.

Recommendation 29 (R29) is OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S13	**Suggestion:** VARANS should be provided with a legal document that specifies clear guidelines that allow for non-reactive, unannounced inspections, at the discretion of VARANS.

According to the Atomic Law on Nuclear Energy, VARANS is assigned the responsibilities to perform "specialized inspection function" as defined by the law on Inspection. In addition, the 63 DOSTs are assigned to perform inspections in their respective province.

An amended Law on Inspection has been adopted on 15 November 2010 (N°56/2010/QH12). The law specifies in its article 37 that inspections can be conducted under approved plans, which are communicated to the licensees (according to the article 36) or conducted upon detecting "signs of law violations of agencies, organization or individuals", after complaints or denunciations, in the framework of prevention and combat of corruption or under assignments by the Minister of Science and Technology.

In absence of serious event (violations, incident etc.), the only legal way to proceed to an unannounced inspection is to get an assignment by the Minister of Science and Technology, which cannot be obtained in practice, in absence of serious event.

The Government could take the benefit of the next amendment of the Law on Atomic Energy to introduce a paragraph dedicated to the inspection process by the regulatory body, which could include the possibility to organise inspection in the field of nuclear and radiation Safety at any time, without the need to justify a particular ground for its organisation.

Suggestion 13 (S13) is OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R30	**Recommendation:** VARANS and DOST should have a more formal, defined process to conduct inspections following the reporting of abnormal occurrences and other

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	incidents, based on the risk posed by the event. Conducting unplanned inspections should not be limited to situations where violations are known to have occurred.

Article 3 of the MOST Circular 19/2010/TT-BKHCN, adopted on 28 December 2010 establishes a process for VARANS to conduct inspections. For example, Chief inspector of DOSTs is responsible to conduct a reactive inspection within 5 days working days after the notification of an event and he is required to submit copies of the inspection protocol established on the spot and conclusions to the MOST's and VARAN's inspectorates within 2 working days after the inspection.

Among 65 inspections conducted by VARANS in 2013 (against 120 in 2008), 10 were announced (5 in 2008), following notifications of incidents by licensees[10].

However, the legislation still doesn't provide for carrying out unannounced inspection without the previous notification of incident or complaints or denunciation. Therefore, the second part of the recommendation remains open.

Recommendation 30 (R30) is OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R31	**Recommendation:** The regulatory body should be provided with the authority to withdraw an authorization for a period of greater than six months, as may be necessitated by the severity of the noncompliance.

According to the Government Decree n°107/2013/ND-CP dated 20 September 2013 on sanctions of administrative violations in atomic energy, VARANS is empowered

- to withdraw authorisation in period range from 6 to 12 months, in the limited case of false record or information provided to the State,
- to withdraw authorization in period range from 1 to 3 month period range for any other violation.

[10] Concerning the decrease of the global number of inspections, see recommendation 2 on staffing and financial resources.

The Government should consider to extent the period range of withdraw of authorisation in consistence with the severity of the violations.

Recommendation 31 (R31) is OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S14	**Suggestion:** The regulatory body should ensure that development continues to proceed on the Decree on administrative penalty in accordance with Law on Atomic Energy, as identified in task 1.1.2 of the Proposal of Action Planned for Regulatory Body - Viet Nam, 2009.

The Government Decree n°107/2013/ND-CP on sanctions of administrative violations in atomic energy has been published on 20 September 2013.

Suggestion 14 (S14) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S15	**Suggestion:** VARANS should provide specific timelines in which all remedial actions must be taken following the reporting of deviations or violations of minor safety significance on inspection reports. Where the facility cannot carry out the necessary actions in the time period allowed, the facility should report to VARANS on the reasons for failing to respond so that VARANS can decide on the appropriate regulatory follow-up action.

The findings of inspections, including deviations and violations, are reported in the inspection protocol finalized on the spot, as well as in the inspection findings sent within 10 days after the inspection to the licensee. Important request are associated with a time period allowed for its implementation. The Licensee is provided the possibility to answer to the conclusions of the inspection.

In the particular case of the research reactor of DALAT, the practice is to share the draft conclusions with the licensee before finalizing it, in order to offer him the possibility to correct factual errors or to express disagreements.

The main follow-up actions by VARANS in case of deficiencies in the implementation of corrective actions are reminding letters, the organisation of follow-up inspections one year after, but only for significant violations associated with significant risk or large facility.

The procedures for conducting inspection should be further developed to include the request to include specific timelines for every corrective actions requested by inspectors.

Suggestion 15 (S15) is OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R32	**Recommendation:** MOST, VARANS and the DOSTs should determine the extent of the authority of the regulatory inspectors to take on the spot enforcement actions.
S16	**Suggestion:** MOST, VARANS and DOST inspectors should be provided with a legal document which describes the sanctions and timeliness of the application of those sanctions, which can be imposed by the inspector without further consultation. Where such approval is not possible to be given to the inspector in the field situation, the same information should be framed so that immediate action can be taken once the appropriate level of approval has been secured.

The Law on Enforcement (15/2012/QH13) associated with the Decree 107/2013/ND-CP dated 20 September 2013 on Government requirements on Enforcement of violations on atomic energy field provides a wide range of enforcement actions, including the withdraw of authorisation (cf. recommendation 31 above). According to these Law and Decree, the Inspection team leader is legally empowered to proceed with the enforcement actions. The practice is however to refer first to the DG of VARANS to inform him about the situation and to confirm with him the decision to take.

Recommendation 32 (R32) is CLOSED and Suggestion 16 (S16) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S17	**Suggestion:** The regulatory enforcement policy in the field of medical facilities should be discussed and coordinated among MOST, VARANS, DOSTs and the Ministry of Health and its implementation should be clearly established in the forthcoming regulations that the Ministry of Health will issue in compliance with the requirement 33 (2) (b) of the Law on Atomic Energy.

The Decree 107/2013/ND-CP dated 20 September 2013 on Government requirements on Enforcement of violations on atomic energy field was originally drafted in cooperation with the Ministry of Health, MOST, including VARANS and the DOSTs.

According to the Article 33.2 (b) of the Law on Atomic Energy, the Ministry of Health is in charge of the establishment of regulation on exposure guidance levels for patients. To answer to this article, MOST and the Ministry of Health have published a joint circular N°13/2014/TTLT-BKHCN-BYT on 9 June 2014 in ensuring radiation safety in the medical area, including requirements in the field of patients' exposure.

Suggestion 17 (S17) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF INDUSTRIAL, RESEARCH AND MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R33	**Recommendation:** VARANS should develop specialized on the job training for its inspectors and DOST inspectors of medical facilities.
S18	**Suggestion:** For the implementation of the on-the-job training, VARANS should make arrangements with a teaching hospital in order to allow the inspectors to be trained by specialists in the medical uses of radiation, e.g. medical physicists, medical specialists, medical technologists.

VARANS has only 2 permanent inspectors, one Chief inspector, who takes this responsibility in 2008, and one other permanent staff. These inspectors are assisted by 10 less experienced staff, generally recruited directly after the university under one year contract. The competence in the field of inspection, which is a key function of a regulator, is consequently very fragile

and not sustainable. The need for training this staff following a well-established and formalized program is then of prime importance.

All Staff working for the inspection division need first to perform the training organised by the State's general inspectorate. This training is more dedicated to the legislation governing all types of inspections in Viet Nam. No additional training programme is offed by VARANS. The recently recruited assistant inspectors are trained on the spot, following the Chief inspector.

DOST inspectors are trained by VARANS during training courses organized by the MOST Inspectorate. .

High priority should be given to the implementation of the recommendations R33 and S18.

Recommendation 33 (R33) and Suggestion 18 (S18) are OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R34	**Recommendation:** VARANS should develop a planned and systematic inspection programme and procedures for research reactor which should take account of the potential magnitude and nature of hazard associated with different stages of research reactor.

VARANS now conducts one in depth inspection on the research reactor of DALAT every year (10 days to 2 weeks with 8 staffs of VARANS, 6 of whom are temporary contractors with no legal powers and little experience compared to the 2 full-time inspectors). This year, the topical priorities are the operation of the reactors, maintenance, human resources, environmental monitoring. Last year, the priorities were the license limits and conditions, the operation of the reactors, the management of waste and the production of radioisotope.
The in-depth inspections which are now conducted result in significant corrective actions requested by VARANS. The identification of lack of equipment mentioned in the safety analysis report of the reactors (two diesel generators are mentioned in the report and only one is present on the site) resulted in the request by VARANS to review and revise, if necessary, the safety analysis report.

Recommendation 34 (R34) is CLOSED

ACTIVITIES OF THE REGULATORY BODY:
INSPECTION AND ENFORCEMENT OF THE RESEARCH REACTOR
RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S19	**Suggestion:** VARANS should be provided with a legal document that specifies clear guidelines that allow for non-reactive, unannounced inspections, at the discretion of the VARANS in research reactor.

See suggestion S13.

Suggestion 19 (S19) is OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R35	**Recommendation:** VARANS should make the database system for the tracking and trending of inspection findings readily available to all inspectors for use as a trending tool for research reactor and for assisting in inspection planning.

The inspectors of VARANS summarize the conclusions of every inspection in an Excel table, which helps them to identify the priorities for the next years. In a similar way, the inspectors of DOSTs fill in a form after each inspection they perform in the field of radiation safety and send it to VARANS. This form contains 16 simple indicators, which are also used to identify priorities for inspections.

The database RIAVN, which contains the register of radioactive sources, should also contain information on the related license. In practice, the inspection division doesn't consult this database due to software errors to prepare inspection but request a copy of the license by the Licensing division.

VARANS has no plan and associated identified budget to develop a software for tracking and trending of inspection findings.

Recommendation 35 (R35) is OPEN

ACTIVITIES OF THE REGULATORY BODY: INSPECTION AND ENFORCEMENT OF THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R36	**Recommendation:** MOST and VARANS should ensure effective coordination so that enforcement actions can be taken in a timely manner commensurate with the potential nature and hazard pose to workers, public or the environment.

The Government Decree n°107/2013/ND-CP dated 20 September 2013 provides a wide range of sanctions, including fines and cases of withdraw of the authorization.

Recommendation 36 (R36) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: DEVELOPMENT OF REGULATIONS AND GUIDES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S20	**Suggestion:** The draft plans on the development of regulation should be completed to become a National Strategy for the production of regulations and guides and for the revision of existing ones, covering all fields of nuclear safety and radiation safety controlled by VARANS. This strategy should include the following elements: • *determination of the need for the new regulations or the revision of the existing documents, including all relevant information;* • *setting the priority for development of the regulations;* • *determination of the scope of the proposed regulations or revisions; and* • *determination of the resources to be employed, depending on the resources available and on the time-scale for the preparation and establishment of regulations and guides.* • *the necessary time for implementing the new regulations.*

Findings from the 2014 Follow-Up Mission

Within the Legal Document System in Viet Nam, the top of the hierarchy is the Law. Below this are Government Decrees, Prime Ministerial Decisions and Ministerial Circulars, in descending order of hierarchy. The Circulars are equivalent to regulations with instructions on implementation. Below this level are the Technical Documents, consisting of Technical Regulations, which are binding for implementation, and Technical Standards, which are nonbinding for implementation.

In 2013, a Prime Minister Decision was released regarding the development plan for regulations associated with the development of nuclear power in Viet Nam. Official Document No. 248/TTg-KTN, dated 19 February 2013, lays out the legislative agenda, including timelines, for the development of requirements related to the implementation of nuclear power. Included in Official Document No. 248 are plans for the amendment of the Law of Atomic Energy by 2013, Government Decrees for the policy on training in the nuclear energy field, a list of additional Prime Minister Decisions to be prepared and a list of Circulars that will be developed by ministries associated with the implementation of the nuclear power program.

Progress on meeting the timelines laid out in Official Document No. 248 is reported annually. Currently, the Official Document is under review and VARANS is assisting in the preparation of an updated version of the plan. Some documents will be combined, others added and the schedule for implementation will be adjusted accordingly. As an example, amendments to the Law of Atomic Energy are not expected to be in place until sometime in 2016.

The team noted the apparent focus on the development of the legislative requirements for the implementation of a nuclear power program. VARANS staff is of the opinion that there is currently sufficient documentation in other regulatory areas. Nevertheless, the team was advised that all of the legislative requirements are reviewed on a five-year cycle to ensure that they are kept up to date and reflect current needs.

The team noted that while the development of the legislative framework for the introduction of nuclear power appears to be comprehensive, it was further noted that there appears to be no plan covering the development of framework elements for radiation facilities and activities and the development of that part of the legislative framework is carried out on an as-needed basis.

Suggestion 20 (S20) is OPEN

ACTIVITIES OF THE REGULATORY BODY: DEVELOPMENT OF REGULATIONS AND GUIDES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S21	**Suggestion:** VARANS should review this national strategy, taking account of good international practices and with broad consultation, to ensure that it covers all important areas and to help defining priorities.

Liaison opportunities have been established with other countries and service providers to obtain information, training and advice as they advance their regulatory program. Memoranda have been signed with Japan, the United States and with the UK to provide for the sharing of information and training opportunities for VARANS staff.

Legislation that is being drafted for adoption by Viet Nam has been shared with regulatory authorities in other countries, such as the US Nuclear Regulatory Commission and the UK Office of Nuclear Regulation. These agencies are encouraged to provide comments and feedback on the draft document for consideration by Viet Nam.

VARANS makes extensive use of IAEA documents and training programs to provide a basis for the development of new legislation.

When the national strategy is finalized, VARANS will have the process in place for the review of the strategy, including taking account of international practices.

Suggestion 21 (S21) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: DEVELOPMENT OF REGULATIONS AND GUIDES FOR MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R37	**Recommendation:** Regulations and guides for each specific medical practice should be developed by MOST, VARANS and the Ministry of Health, as appropriate.

Joint Circular No. 13/2014/TTLT-BKHCN-BYT, "Requirements on Radiation Safety in the Medical Field", dated 9 June 2014 was approved by both the Ministry of Health (MOH) and the Ministry of Science and Technology (MOST). This is a comprehensive joint circular that enshrines in legislation many of the non-binding recommendations previously found in Viet Nam Standard TCVN-6869:2001 "Radiation Protection – Medical exposure – General Provisions".

Further discussion of this Joint Circular is found in Chapter 5, Controlling Medical Exposures, of this report.

Recommendation 37 (R37) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: DEVELOPMENT OF REGULATIONS AND GUIDES FOR MEDICAL FACILITIES RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S22	**Suggestion:** The relevant professional societies should be involved at an early stage during the development of those regulations and guides.

The team was advised that according to the Law on the Promulgation of Legal Documents No. 17/2008/QH12, there is a requirement for consultation of persons external to the drafting ministry.

Chapter 3, Article 31(1) of this Law requires that drafting boards include other experts and scientists. The team was advised that Chapter 3, Article 35 stipulates that comments must be collected and reviewed for consideration. In addition to these provisions, there are

opportunities for comment from any other interested person in the general public as the proposed legislation is posted on websites and in popular newspapers.

Suggestion 22 (S22) is CLOSED

ACTIVITIES OF THE REGULATORY BODY: DEVELOPMENT OF REGULATION AND GUIDES FOR THE RESEARCH REACTOR RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S23	**Suggestion:** VARANS should benchmark the different existing regulatory system regarding nuclear facilities to develop its own regulatory approach, with an appropriate balance between performance based and prescriptive regulations, before developing detailed regulations and standards.

Findings of the 2014 Follow-Up Mission

The current regulatory framework continues to develop and evolve. However, there has been progress from the perspective of gaining from the international experience and knowledge that is available. Memoranda of understanding have been signed with other countries and consultants to enhance the opportunities for learning and comparison for VARANS staff. The team was advised that an international expert has been retained to review all aspects of the current situation, including legal, existing standards and inspection approaches. The outcome of this review may serve to address the suggestion.

Suggestion 23 (S23) is OPEN

5. CONTROL OF MEDICAL EXPOSURES

RADIATION SAFETY IN MEDICINE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R38	**Recommendation:** The Government should ensure the provision of the regulations which are necessary for implementing the Standards according to the requirement in Art.33 2 b) Law on Atomic Energy and their timely issuance.

The Review Team found that substantial progress has been made in the area of establishing greater control over medical exposures. Since 2009, a new Circular has been promulgated. Joint Circular No. 13/2014/TTLT-BKHCN-BYT, "Requirements on Radiation Safety in the Medical Field", dated 9 June 2014 was approved by both the Ministry of Health (MOH) and the Ministry of Science and Technology (MOST). This is a comprehensive joint circular that

enshrines in legislation many of the non-binding recommendations previously found in Viet Nam Standard TCVN-6869:2001 “Radiation Protection – Medical exposure – General Provisions”.

The team was advised that Article 20 of the legally binding Joint Circular No.13 brings together many of the elements required for effective control of medical exposure, including but not limited to:

- Establishing responsibility for control of medical exposure with the medical practitioner. [Ref: Article 20a];
- Ensuring that preference is given to examinations and treatments that do not use ionizing radiation where more than one option exists. [Ref: Article 20b];
- Special consideration is given to women who may be pregnant and also to children. Exposure should be considered only when there are no other alternatives. [Ref: Article 20c];
- The establishment of Diagnostic Reference Levels (DRL). [Ref: Article 20b];
- Using information obtained in previous examinations to avoid repetition of exposure for same test. [Ref: Article 20d];
- Annual calibration and maintenance to assure safe operation of all medical radiation equipment, including the annual calibration of radiation monitoring equipment. [Ref: Article 20 (2)b];
- Specific practical guidance to reduce dose to sensitive, non-target tissue and gonads. [Ref: Article 20(3)a];
- Ensuring that the nuclear medicine dose or treatment delivered is as was prescribed by the medical practitioner. [Ref: Article 20(5)];
- Recommending that there be only one nuclear medicine therapy patient per room; and where this is not practicable to use a mobile shield between the patients [Ref: Article 20(6)];
- Establishment of Quality Assurance/Quality Control (QA/QC) programmes in medical facilities. [Ref: Article 20(7)a&b];
- Provide for the protection of carers and comforters of patients undergoing radiological procedures, including instructions, protective clothing and setting a dose limit of 5 mSv per treatment. [Ref: Article 20(8)a, b & c]; and
- Establish requirements for investigation in the event of patient overexposure, including doses to the wrong tissue or wrong person. [Ref: Article 20(9)]

The team was advised that other parts of Joint Circular No. 13 pertain to additional issues that are normally associated with the control of medical exposure, such as:

- The requirement for periodic health checks for occupational exposed workers is covered by Article 18;
- Work area radiation monitoring is prescribed in Article 15;

- Article 16 sets out the requirements for dose assessment of occupational exposed workers; and

- Article 21 covers the control of public exposure associated with the operation of medical facilities.

The team was informed that requirements for radiation dose monitoring, included in Joint Circular No. 13, are also referred to in Circular 19/2012/TT-BKHCN, "Safety Requirements for Occupational Exposure Control and Public Exposure Control", dated 8 November 2012 and the requirements for the management of radioactive waste is provided in Circular No, 22/2014/TT-BKHCN, dated 25 August 2014 "Regulations on Radioactive Waste and Disused Source Management". This cross-referencing of the requirements emphasizes the importance of maintaining control over all forms of exposure and clarifies that such measures for exposure control must be applied to medical facilities.

During the review, some potential areas for further strengthening regulatory control in the medical area were identified:

- Ensuring that the appropriate DRL is used for a child or an adult and that the radiation machines are correctly set, taking into account age, gender and body mass;

- Defining the criteria for when an overexposure to a patient may have occurred;

- Understanding the implications of an underexposure to a patient and the procedures for responding to such a situation; and

- Safe management of deceased patient's body if they were to die shortly after undergoing radionuclide treatment.

Recommendation 38 (R38) is CLOSED

RADIATION SAFETY IN MEDICINE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Suggestion:
S24	VARANS should assume a proactive role in fostering the cooperation among the Vietnamese regulatory authorities and the Ministry of Health providing sound information on the risks derived from the lack of regulatory control of medical exposures and offering assistance in drafting the regulations that allow to implement the requirements of the Standards.

Findings from the 2014 Follow-Up Mission

VARANS led the development of Joint Circular No. 13/2014/TTLT-BKHCN-BYT and coordinated the required consultation process. VARANS staff prepared a draft version of the Joint Circular and engaged the required divisions of MOST and MOH in consultation. This included organizing a meeting of technical specialists from both MOST and MOH to review

and discuss the comments that had been received on the draft circular. Once a more definitive version of the Joint Circular was agreed upon by these parties, VARANS staff consulted more broadly, including the Department of Science and Technology (DOST) and the Department of Health (DOH) in each of the 63 provinces. The draft was also sent to larger medical facilities for comments. All of the received comments were considered and evaluated during the drafting of the final version of the Joint Circular. Where comments were made that related to the practical implementation of the Joint Circular, changes were made.

While the process that was followed in the development of the Joint Circular is comprehensive and substantial, it follows the existing requirements of Vietnamese legal procedures. The team was informed that this is the normal process for the development of such a document. Furthermore, the team was also advised that there has been no change in the process since 2009.

The team felt that if VARANS staff engaged other agencies at the planning and drafting stages of new legislation this would help ensure that all stakeholders understand the opportunities for input at the earliest stages of development. This could be carried out through the development of a consultation document that identifies the areas which should be addressed without specifying how they would be addressed. In this way, stakeholders can have a greater role in shaping proposed legislation, which will foster greater ownership, cooperation and collaboration.

Suggestion 24 (S24) is OPEN

RADIATION SAFETY IN MEDICINE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R39	**Recommendation:** The Government through the appropriate authorities should develop a comprehensive programme for providing adequate and specific training at least to the following persons: • Physicians who are responsible for individual justification and conducting the exposures • Radiation technologists or equivalent staff and other relevant health professionals.

Findings from the 2014 Follow-Up Mission

There is an existing program for the training of all occupational exposed workers that may use radiation or radioactive material, in areas of industry, medicine and academic research.

In regards to training for physicians, the team was advised that there is currently no additional training provided to medical staff, other than the routine training that all occupational exposed workers receive. VARANS staff advised the team that there is only a very brief overview of radiation protection provided in the university to medical students, although those medical practitioners who specialize in radiation diagnosis and therapy receive some additional training.

Noting that Joint Circular No. 13 states that the medical practitioner is primarily responsible for control of medical exposure to the patient, the team considered that a detailed analysis (compared to the requirements of IAEA's Basic Safety Standards, GSR Part 3) is needed with regard to the education and training of medical physicists, radiological medical practitioners, medical radiation technologists and, for complex nuclear medicine facilities, radiopharmacists and radiochemists.

Recommendation 39 (R39) is OPEN

RADIATION SAFETY IN MEDICINE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R40	**Recommendation:** The Government, through the appropriate authorities, should develop a national strategy for building competence in the Medical Physics area and establish formal means for accrediting qualifications.

Findings from the 2014 Follow-Up Mission

Viet Nam currently has 33 medical facilities which use linear accelerators for patient therapy and 41 medical facilities which provide therapeutic nuclear medicine. However, the team was advised that the availability of medical physicists remains a critical issue. Currently, there is no training program for medical physics in any Viet Nam university as there is no lecturer in this field. Most of the persons currently providing medical physics services started out as physicists and then were trained on basic medical information to allow them to carry out their duties. Viet Nam does not have any certification process for medical physicists. The team also noted that neither the Law of Atomic Energy nor the Joint Circular No. 13 contains a requirement for a medical facility to have a medical physicist.

VARANS staff state that they have attempted to engage the cooperation of the MOH and the Ministry of Education and Training (MOET) on this issue but have been largely unsuccessful as it is not seen as priority issue by either ministry. Similarly, the development of an action plan to address this issue remains unaddressed.

The team noted that since 2009, approximately $150M in new funding for training in nuclear power areas has been committed by the government but most of this money went to preparatory activities associated with the development of nuclear power. It was noted that only a few fellowship attendees in the field of medical physics were approved.

VARANS staff reported that they have developed a working relationship with an association of physicists to begin to address this issue. VARANS staff also plans to work with counterparts in Singapore on this matter.

Noting that 30 radiotherapy patients were reportedly recently overexposed, the necessity of having properly trained and qualified medical physicists should be a high priority for Viet Nam. The requirements for the training and qualification of medical physicists should be developed by all relevant stake holders (for example, MOET, MOST, MOH, VARANS).

As described in IAEA GSR Part 3, competence of persons is normally assessed by the State by having a formal mechanism for registration, accreditation or certification of medical physicists in the various specialties (e.g. diagnostic radiology, radiation therapy, nuclear medicine). The team encourages that legislation be developed to require a medical physicist at each medical facility, especially where there is the therapeutic use of radionuclides or radiation generating equipment. This should be accompanied by a sufficient training and qualification program for medical physicists.

Recommendation 40 (R40) is OPEN

RADIATION SAFETY IN MEDICINE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R41	**Recommendation:** The Government, through the appropriate bodies, should expand the programmes under development for performing comprehensive surveys of patient doses with special focus on CT and interventional radiology, and to engage professional societies in developing and implementation of Diagnostic Reference Levels (DRLs).

Findings from the 2014 Follow-Up Mission

VARANS staff is currently engaged in a pilot project, encompassing three regions of the country, to assess the dose delivered to a patient as a result of their medical care. VARANS staff have developed procedures to assess the patient dose in the areas of conventional radiography, CT scanning and interventional radiography. The procedure is used to calculate the dose that was delivered to the patient as a result of their care and, at this stage, remains a retrospective approach. The information obtained from the project is intended to be used to compare the calculated doses against the DRL's that are specified in Joint Circular No. 13/2014/TTLT-BKHCN-BYT.

Following validation of the approach used in this pilot project, VARANS staff intends to expand the survey to all areas of the country. The team was advised that VARANS already has the necessary authority to expand this project.

VARANS is encouraged to continue these efforts, with a view to eventually developing a process for more accurately predicting the dose to the patient before administration. Development of such a control point prior to dose delivery would provide an even greater measure of control over medical exposures, allowing for dose reduction and exposure optimization.

Recommendation 41 (R41) is OPEN

6. EMERGENCY PREPAREDNESS AND RESPONSE

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R42	**Recommendation:** VARANS should write a National Radiological Emergency Plan and the task should be finished in a reasonable timeframe.

In May 2012 the Ministry of Science and Technology approved the financing plan to develop a National Radiological and Nuclear Emergency Response Plan. The draft plan has been written and the MOST is going to distribute it to all stakeholders for a review before it is submitted for approval by the Prime Minister, which is planned to be in 2015.

VARANS has prepared a draft National Radiological and Nuclear Emergency Response Plan, which is quite comprehensive, containing the following four chapters: General Provisions, Functions and Responsibilities of Participating Organizations, Activities in Response Phase, Finance and Emergency Preparedness.

The draft National Radiological and Nuclear Emergency Response Plan represents a major step towards establishing a comprehensive emergency response capability, but it needs to clearly identify the stakeholders for each action required by this plan as well as provide more substantial information about the existing resources needed for implementing those actions (e.g. organisations capable of providing resources, type of resources, etc.).

Recommendation 42 (R42) : is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R43	**Recommendation:** Threat assessment shall be performed by VARANS for all radioactive sources and installations in Viet Nam for the full range of postulated events taking into account their probability of occurrence.

VARANS is still developing a threat assessment for all radioactive sources and installations in Viet Nam.

The team noted that the IAEA threat categorization was adopted by the Circular (see Recommendation 44), therefore it is expected that the outcome of a threat assessment will be relevant threat categories for Viet Nam. In line with the GS-R-2 a threat assessment should (i) consider any threat associated with nuclear facilities in other States, (ii) consider the likelihood, nature and magnitude of the various radiation related threats, (iii) identify any

populations at risk, (iv) identify facilities, sources, practices, on-site areas, off-site areas and locations for which a nuclear or radiological emergency could warrant implementation of protective actions, (v) identify locations at which there is a significant probability of encountering a dangerous source.

It is planned that the threat assessment is completed in 2014 and its summary will be included in the National Radiological and Nuclear Emergency Response Plan.

Recommendation 43 (R43) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R44	**Recommendation:** The threat categorization as required in GS-R-2, para. 3.6, should be addressed and applied whenever needed.

The threat categorization was adopted in the Circular 24/2012/TT-BKHCN "Format and Content of Emergency Plans at a Facility and Provincial Level", which is in line with GS-R-2, para. 3.6.

This threat categorization can be used as an efficient planning tool for developing facility, provincial and national radiation emergency response plans. It should be considered that the threat assessment, referred to in Recommendation 43, applies to this categorization. In developing future emergency planning and response documents it should be considered that this threat categorization is applied together with a relevant guidance, e.g. EPR-Method 2003.

Recommendation 44 (R44) : is CLOSED

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R45	**Recommendation:** An emergency classification system should be in place which would enable prompt initiation of co-ordinated and pre-planned emergency response on and off the site.

An emergency classification system was developed and placed in the draft National Radiological and Nuclear Emergency Response Plan.

However, it should be noted that the proposed emergency classification system is not fully in line with the recommendations of GS-R-2. Although the emergency classification system

links each class of emergency with the initial response actions, it is not clear which response organizations are in charge for implementation of those actions (GS-R-2, para. 4.25 states that *»…The responsibilities and initial response actions of all response organizations shall be defined for each class of emergency«*). It is also important that each individual operator implements this classification and adapts it to its specific facility parameters (so called Emergency Action Levels are specific for each facility). The operators have not yet put this classification system into their procedures. In addition, the proposed emergency classification system needs a thorough review, because the system of threat categories for facilities is too basic and does not meet any current industry standards. The classification system for radiation facilities contains need to be revised, because it is rather descriptive with many parameters, which are not clearly defined and these parameters should be measurable (e.g. terms such as: small/large, "out of control", highly exposed, appearance of deterministic effects, etc. are neither defined nor measurable).

The team was informed that VARANS intends to develop more detailed guidance on emergency classification for the licensees of radiation facilities. However, it should be made clear that the actual procedures, which need to be applied in case of emergency, should be developed and implemented by the operator.

It is not necessary that the emergency classification guidance is a part of the National Radiological and Nuclear Emergency Response Plan and it can be removed from the NNERP, in particular, after the guidance, mentioned above, is developed.

Recommendation 45 (R45) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R46	**Recommendation:** For the sake of consistency with international standards, the operational intervention levels (OILs) should be adopted by VARANS and arrangements for their implementation made.

VARANS defined the operational intervention levels (OILs) in the draft National Radiological and Nuclear Emergency Response Plan.

The OILs are also contained in the draft Circular on Radiological and Nuclear Emergency Preparedness and Response which still needs to be published. The OILs in both documents are consistent with the OILs that were used in guidance TECDOC-955 and were applicable at the time of the 2009 IRRS Mission. In 2011 the new guidance on OILs was published in GSG-2.

Both draft documents should be revised and "the latest" OILs from GSG-2 should be applied in order to bring the documents up to date.

Recommendation 46 (R46) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S25	**Suggestion:** Responsibilities for decision-making regarding agricultural countermeasures and food consumption in the event of an emergency should be clearly addressed in the national emergency plan. Also sampling procedures for food, crops, and agricultural soil in the event of an emergency should be included in the appropriate procedure and the measuring capabilities designated.

Responsibilities for decision-making regarding agricultural countermeasures and food consumption in the event of an emergency have been addressed in the draft National Radiological and Nuclear Emergency Response Plan, but consideration should be given to adding a separate section to this plan. This section neither contains anticipated response actions for agricultural measures nor addresses sampling of food, crops, and agricultural soil in the event of an emergency, as well as identifying organizations capable of performing gamma spectroscopy of those samples. For the time being there are two organizations in Viet Nam, which can carry out gamma spectroscopy VARANS and VINATOM. This section needs basic information about which organization is responsible for sampling and measurements as regards to agricultural countermeasures but the appropriate procedures should be developed and a reference should be made to them.

Circular 17/2011/TT-BYT "Limits for Contamination of Foodstuffs" was issued on 17.5.2011, which contains radioactive contamination limit levels in foodstuffs. The basic elements for decision making about agricultural measures therefore exist, i.e. limits and measuring capabilities. The two organizations in charge of decision making in the event of contamination of foodstuffs are the Ministry of Health for processed food and the Ministry of Agriculture for raw products. However, appropriate procedures are still to be written and revising the draft National Radiological and Emergency Response Plan should be considered.

Suggestion 25 (S25) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R47	**Recommendation:** All relevant organizations should take part in the development of emergency response management and operations organization, and implement a command and control system for adequate response to a nuclear or radiological emergency.

Relevant organizations, which should take part in the development of the emergency response management organization and implement a command and control system for adequate

response to a nuclear or radiological emergency, were identified in the draft National Radiological and Emergency Response Plan.

The draft National Radiological and Emergency Response Plan in the Chapter on Functions and Responsibility of Participating Organizations lists the organizations which can take part in emergency response as well as listing their responsibilities. The arrangements for implementation of a command and control system are not very clearly elaborated in the draft National Radiological and Emergency Response Plan, since other organizations (i.e. national agencies) are not named as a single institution in the Chapter on Activities in Response Phase, but are always "hidden" in the term "other national agencies" or similar.

For each scenario the appropriate organizations taking part in the emergency response in that scenario should be identified.

This recommendation cannot be closed because only the draft document exists that still needs some revision before the provision of the GS-R-2, para. 4.10, is met.

Recommendation 47 (R47) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R48	**Recommendation:** VARANS should initiate the establishment of a network of notification points across the country that includes radiological emergencies.

VARANS has not initiated the establishment of a network of notification points across the country that would ensure a reliable notification of radiological emergencies.

At this time, if the local police are informed about a radiation emergency then this information is to be reported to a respective DOST. If the notification is received through a DOST then they would prepare the information to call VARANS. If the emergency is occurring at a facility, the operator would contact VARANS directly.

The team was informed that VARANS is the established center for emergency preparedness however a single point of notification does not exist. Within the country, there is a 113 to report to the police and other numbers for other first responders. The operators of the systems have not been trained for reporting radiological emergencies to VARANS. Furthermore, VARANS does not have a point of contact that is available 24/7. Emergency contact points should be set up such that they are available at all times and do not depend on one person to be present.

Circular No. 24/2012/TT-BKHCN regarding threat categorization and how to develop emergency plans, contained a form that will be used to guide the first person receiving information regarding an event to ensure that a complete account is collected. This form would normally be completed by a person at a DOST and it includes information regarding which emergency services have been provided, the name of the person making the report and information regarding location and nature of the incident.

Recommendation 48 (R48) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S26	**Suggestion:** This network can be used to receive notification and to initiate the off-site response to an emergency of any type (conventional, nuclear or radiological).

The system of notification of radiological emergencies has not been established as required in Recommendation 48 (i.e. establishment of a single telephone number for notification), therefore this network cannot be used to receive notification and to initiate the off-site response to an emergency of any type (conventional, nuclear or radiological).

The notification system that is used to provide information from the DOSTs to VARANS is informal and not documented and cannot be deemed that it meets the Recommendation 48.

Suggestion 26 (S26) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R49	**Recommendation:** Viet Nam should establish its Early Notification Contact Point in line with the IAEA requirements, including the operation of communication system (ENAC) and taking part in the exercises/tests aimed at testing the system.

VARANS is designated as the IAEA Early Notification Contact Point in Viet Nam and is registered in USIE system. USIE is the IAEA system for receiving and dissemination of information about emergencies and emergency significant events among its Member States. USIE system is a successor ENAC and NEWS which were unified into USIE.

There are three persons in VARANS who have access to USIE. The procedure(s) and regular training for operation of the national Early Notification Contact Point do not exist. In spite of this VARANS takes part in the IAEA run exercises and tests, but results of these exercises were not presented to the team.

It can be concluded that progress has been made, but for reliable operation of a national IAEA Early Notification Contact Point additional activities should be considered, such as 24/7 availability, regular training, procedure(s), exercising in sending and receiving information as well as sending and receiving assistance requests.

Recommendation 49 (R49) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R50	**Recommendation:** Emergency workers should be designated and informed about risks of radiation exposure in advance and dose limits for emergency workers should be adopted.

Circular no. 19/2012/TT-BKHCN, regarding safety requirements for occupational exposure control and public exposure control, prescribes dose limits for emergency personnel. These are contained in Article 22 of the Circular. Article 21 of the same Circular has requirements for emergency workers, including the requirement for operators to maintain an emergency response capability. Furthermore this Article also requires operators to take all measures possible to keep radiation exposure doses below the limits and to follow the emergency plan.

However, there is no information about the designation of emergency workers prior to an incident. For instance, the National Radiological and Nuclear Emergency Response Plan should include that in the vicinity of the significant installations (e.g. Dalat research reactor, facilities with high activity sources) the first responders (police, firefighters, paramedics) should be designated as emergency workers and should receive training about their potential involvement in a radiation emergency.

Recommendation 50 (R50) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R51	**Recommendation:** Public information should be addressed in the future documents, i.e. national and provincial emergency plan and relevant procedures. The staff responsible for preparation of press releases should be designated in advance. In addition, the information pathways should be described, outlining which media information should be sent, by which means (facsimile, e-mail, telephone), and identifying the responsible person to authorize and send out this information.

Public information has been addressed in the draft National Radiological and Nuclear Emergency Response Plan, which requires establishment of a Public Information Center(s) (PIC) and defines from which organizations the public information officers shall be represented in the PIC.

The team was informed that the draft Circular on Radiological and Nuclear Emergency Preparedness and Response, which should set the requirements for this area, it was concluded that this document needs a thorough review to clearly differentiate between the “Providing Information and Issuing Instructions and Warnings to the Public”, which refers to the

potentially affected public living or just temporarily in the urgent protective actions emergency planning zones, and the "Keeping the Public Informed", which deals with providing information to the media (both terms within the quotation marks are from GS-R-2). Therefore in the relevant chapter of the draft National Radiological and Nuclear Emergency Response Plan it should be considered to add the staff responsible for providing information in the PIC but those who are not public information professionals. In addition, the information pathways should be described, outlining to which media information should be sent, by which means (facsimile, e-mail, telephone), and identifying the responsible person to authorize this information, as well as which organization is responsible to set out and maintain the PIC.

Recommendation 51 (R51) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R52	**Recommendation:** All emergency response organizations should begin developing procedures for radiological emergency response.

Emergency response organizations have not begun developing procedures for radiological emergency response. Although there is a draft National Nuclear and Radiological Emergency Plan, it has not been approved and therefore the elements within it cannot yet be implemented.

Recommendation 52 (R52) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R53	**Recommendation:** The NREP preparation by VARANS and other organizations should include a thorough analysis to determine whether the available resources meet the needs of emergency response, including scenarios anticipated by the threat assessment.

The threat assessment that is required as part of the national nuclear emergency response planning has not been carried out. However, the team was advised that a government document is in preparation which discusses five scenarios for emergency response and the anticipated resources that would be required. Document DTDL-2011-G-78, entitled "Study and Development of National Radiological Emergency Response Plan" contains the information required. The team was advised that sufficient progress has been made on the requirements for this recommendation.

Recommendation 53 (R53) is CLOSED

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R54	**Recommendation:** VARANS should develop a procedure to activate the Technical Support Centre staff in case of an emergency, send its staff to the scene and carry out a response (could be for different scenarios/events). This procedure needs to be exercised before it comes into effect.

The team was advised that there is an informal process in place for activating the Technical Support Center. This informal process is currently based on experience and practice of the participants.

It should be considered to develop a complete procedure which will include the activation process as well as processes to ensure that necessary equipment is in place, ready to be used, functional with sufficient backup and that all parts of the response plan can be activated as necessary. Furthermore, the procedure should be exercised on a periodic basis to ensure that the capability to respond remains available.

The team considers the development of this procedure should be given high priority.

Recommendation 54 (R54) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R55	**Recommendation:** After the provincial and national emergency plans and procedures are developed, VARANS should assist other organizations to prepare and conduct an emergency preparedness training programme. For first responders, this requirement can be met earlier.

The team was advised that training information has been developed through cooperation with the United States. VARANS has developed a list of training information that is available and is using that training material to prepare other parts of the response program.

The provincial DOSTs have annual training sessions and can request training from VARANS on the topic of emergency preparedness and response. However, VARANS does not visit each DOST annually. They only provide training to a DOST when requested. This training meets the requirements of Circular No. 24/2012/TT-BKHCN regarding threat categorization and how to develop emergency plans.

In addition, Circular No. 24/2012 has provisions for VARANS to provide training to the facility operators and this is conducted, also on request.

The team was advised that a comprehensive training program in the area of emergency preparedness is not yet in place although it is planned for development in the near future. The team was not able to obtain any further precision on this timeline. The training that is available is general in nature, since it is not possible to have a dedicated training program without a clear understanding of the requirements and this has to be based on the threat assessment. Currently VARANS has developed training in the following areas:

- emergency management
- emergency response procedures
- role of incident commander
- use of survey and contamination meters
- protection of police and emergency workers
- security of radioactive sources
- lessons learned from other events
- first aid in emergency situations.

The team was further advised that a program for training of first responders in the area of emergency preparedness has been developed but has not yet been implemented. Some training is available for police as part of the larger emergency response training but this is not in regular practice. Furthermore, additional training for fire brigades and other emergency first responders is under consideration.

It has to be noted that all the training described above does not include the use of emergency response procedures, since those have not been developed yet, but the team considers that the training will be more performance oriented, when the procedures are available.

Recommendation 55 (R55) is CLOSED ON THE BASIS OF PROGRESS AND CONFIDENCE

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R56	**Recommendation:** All relevant organizations should take part in testing their emergency response capabilities in an exercise. The exercise should be thoroughly analyzed, and lessons learned should be integrated to improve the emergency response capability.

Conducting exercises for practicing the response to emergency situations and ensuring ongoing emergency response capability is not yet in place. There is only a small, limited program that tests ongoing capability through exercise situations. Conducting widespread exercises remains as part of the long-term planning.

Recommendation 56 (R56) is OPEN

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R57	**Recommendation:** The response organizations should include provisions for establishing and maintaining the required quality assurance programme for radiation monitoring instrumentation and other equipment.

VINATOM and the VARANS Technical Support Center take part in the regular IAEA inter-comparison of gamma spectroscopy capabilities by measuring low activity samples. Although this is not considered complete quality assurance program for emergency preparedness, it is a positive approach that is encouraged to continue. Further development of the quality management systems (QA in GS-R-2 terminology) for ensuring capability to respond to emergency situations should continue. Especially organizations with quality management certificates should be encouraged to bring also emergency preparedness and response under their existing quality management systems.

Recommendation 57 (R57) is OPEN

7. CODE OF CONDUCT ON SAFTY AND SECURITY OF RADIOACTIVE SOURCES

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R58	**Recommendation:** The regulatory body, in conjunction with other Ministries, should begin the promotion of safety culture within the country.

Similarly, the proposed amendments to the Law of Atomic Energy, in which the issue of safety culture was to have been taken into consideration, do not appear to clearly show how the idea of safety culture is explained or promoted. However, it is expected that the proposed changes will establish the basis upon which to further develop the concept of a safety culture. VARANS staff feels that a strong regulatory base will provide the best foundation for building up the concept of safety culture.

Training is an important part of the development of the concept of safety culture. Both the regulator and the licensee have to understand the rationale for safety requirements and how they are more than simple elements in the regulations. There has been progress in the area of training as VARANS has been hosting joint training sessions for its own staff as well as facility staff, encouraging all stakeholders to recognize their duty to safety and security. Through this approach to training, it is hoped that there would be a better appreciation of the role of VARANS, by both its own staff and of the licensees. However, there is insufficient

information to demonstrate that the concept of safety culture is properly and completely included in such training.

The team agrees that some small progress has been made in the development of a safety culture but encourages further continued efforts in this development. The team wasn't provided with evidence demonstrating a systematic approach for introducing a concept of safety culture (i.e. checklists, reports, inspections, action plans, outreach activities, etc.).

Recommendation 58 (R58) is OPEN

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

R59	**Recommendation:** VARANS should make arrangements to provide training to its staff for the implementation of the Code of Conduct. Such training should be sufficient to allow the required staff to evaluate proposals made by facility operators to achieve compliance with the Code.

There has been progress made in addressing this recommendation.

The provisions of the Code of Conduct have been transferred into regulation and VARANS staff has been provided with training on these new requirements. In addition, there is an annual training course for both VARANS staff and operators to ensure that all stakeholders are kept up to date.

As part of the training, information is provided in a background section on the rationale for the requirements that are now in effect. This is expected to help users understand their role in meeting regulatory obligations, which is hoped to contribute to the development of a proper safety culture.

The training process is ongoing and there are plans to provide refresher training. The training also incorporates lessons-learned from local and international events.

This is linked to Suggestion 10.

Recommendation 59 (R59) is CLOSED

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R60	**Recommendation:** VARANS should undertake a programme of outreach for police and other emergency responders to ensure that they clearly understand their actions upon the discovery of, or reporting of, an orphan source. This information should include contact information for persons who are available to respond to such events.

There is no regular outreach program for police and emergency responders. Police and other first responders are engaged when an incident occurs but there is no systematic approach to providing proactive training.

It is specified in Article 7 of Decree No. 07/2010/ND-CP that police officers and emergency responders who encounter radioactive material during the course of their duties are required to report up through their chain of command to a point where contact will be made with either the local DOST or VARANS. One person at VARANS has been designated as an emergency contact for such situations. However, this cannot be considered a consistent point of contact since such a person cannot always be available.

There have been some annual training events for emergency response personnel and sometimes police and other officials are invited to attend. However, these should be considered on a more regular basis.

The emergency response plan of each facility should also specify the point of contact at VARANS but this is not effective in the event of an orphan radiation source.

Recommendation 60 (R60) is OPEN

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R61	**Recommendation:** Decision No. 17/2007/QD-BKHCN should be updated to reflect the Law on Atomic Energy and revised to include categorization of the sources as provided in the Code of Conduct. This should be done in accordance with the IAEA Safety Guide RS-G-1.9.

Circular No. 24/2010/TT-BKHCN, dated 29 December 2010, entitled National Technical Regulation on Radiation Safety Categorization and Classification of Radioactive Sources, has been promulgated. This Circular adopts the categorization of sealed sources which is consistent with IAEA Safety Guide No. RS-G-1.9

Recommendation 61 (R61) is CLOSED

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R62	**Recommendation:** The State should establish a process whereby notification may be made in the event of a situation with potential transboundary implications. The process should include prompt, complete notification of the potentially affected neighbouring States and also provide notification to the IAEA.

In the situation involving a transboundary event, there is no formal agreement with neighbouring countries. A point of contact has been established at VARANS who has the authority to initiate contact with other countries in such an event.

Development of a national emergency response plan is proceeding but there is no process at this time for communication of events that have transboundary implications. The team also noted that this point of contact is a single individual and may not be available at all times, as may be required.

This recommendation can be linked with recommendation 49.

Recommendation 62 (R62) is OPEN

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S27	**Suggestion:** VARANS should conduct more outreach with scrap metal dealers to ensure they understand the implications of the discovery of an orphan source. In addition, the Government should consider ways of mitigating the costs for scrap metal dealers to obtain the necessary monitoring equipment.

Circular No. 19/2012/TT-BKHCN includes requirements for scrap metal dealers to be trained in radiation safety, with an understanding of the measures that should be taken in the event of the discovery of an orphan source. Furthermore, Decree No. 07/2010/ND-CP, dated 25 January 2010 and Prime Minister Decision No. 146, dated 4 September 2007, requires that scrap metal dealers install radiation detection equipment at their premises. However, there is little enforcement of any of these requirements.

There is no regular contact or training plan for outreach with scrap metal dealers. Although VARANS has directed DOSTs to promote an understanding of the implications of a high activity radioactive source this has translated only into a few brochures that have been developed and distributed in larger population centres. It is only in the event of an incident, such as a lost or stolen source, that strong outreach efforts are undertaken and these are usually focussed in the area where the incident occurred.

There has been no assistance offered to help scrap metal dealers acquire the necessary radiation detection equipment. The team was advised that one installation was attempted but the company felt that it would add too much to their costs, making them non-competitive and it was abandoned. Since scrap metal dealers are not licensees, they are not included in inspections.

There is no capacity for monitoring of scrap metal coming into recycle facilities or larger scrap metal dealers. The team noted that this is a significant risk due to the potential for contamination of recycled metal to occur without any means of detection. Although some awareness has been raised with scrap metal dealers with respect to the implications of contaminated metal, there is no systematic program to address this issue.

Suggestion 27 (S27) is OPEN

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R63	**Recommendation:** VARANS should expedite the development of the new Circular regarding radioactive waste management, including the management of disused sources. VARANS should also ensure that guidance is provided to all facility operators regarding the reuse and recycling of radioactive sources.

Circular No. 22/2014/TT-BKHCN, dated 25 August 2014, entitled Regulations on Radioactive Waste and Disused Source Management has been promulgated.

In terms of the management of disused sealed sources and applications to the Code of Conduct, this Circular contains the following provisions:

- Management of disused sources by:
    - Transfer to another authorized user [Ref: Article 6(4)]
    - Return to supplier [Ref: Article 3(3)]
    - Store in a safe manner at a storage facility for a maximum of three years [Ref: Article 9]
- Conditioning of leaking sealed sources [Ref: Article 8(4)]
- Responsibilities of owners of disused sources [Ref: Article 13]

The team is advised that this Circular was based on IAEA guidance documents and is very comprehensive, with sufficient guidance to the owner of disused sources.

This recommendation is linked with recommendation 7.

Recommendation 63 (R63) is CLOSED

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R64	**Recommendation:** VARANS should establish a process for providing prior notification of any exporting activity to the corresponding regulatory body of the importing State. VARANS should also establish a process for receiving such notifications from any exporting State.

A point of contact has been established at VARANS who has the authority to initiate or receive contact with other countries for activities involving the international transfer of risk-significant sealed sources.

Upon receipt of an intended import of a radiation source, the VARANS contact would direct information to the licensing division regarding the nature of the source to be received. The appropriate authorization would be prepared to allow for the import of the sealed source and the transaction would proceed.

The team noted that the point of contact is a single individual at VARANS and this may not be suitable at all times due to limitations on availability. Consideration should be given to establishing a proper point of contact within VARANS for such notifications.

Recommendation 64 (R64) is OPEN

CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R65	**Recommendation:** VARANS should set up a system, including prior notification, to ensure that the intended recipient in an importing State is authorized to receive the material.

Circular No. 08/2010/TT-BKHCN entitled, Notification, Issuance of Licenses and Radiation Worker Certificates, dated 22 July 2010, was promulgated. This Circular requires that where authorization to export a radioactive material is being sought, the application process requires

confirmation of the licence from the regulatory authority in the country where the radioactive material is to be sent.

Recommendation 65 (R65) is CLOSED

8. EDUCATION AND TRAINING

EDUCATION AND TRAINING RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S28	**Suggestion:** VARANS should develop national strategy to ensure that national infrastructures are adequate to provide for education and training of specialists in radiation protection and safety. This national strategy consists of several phases: analysis of training needs; design of a national training programme in a realistic time frame; development and implementation of this programme; evaluation of the effectiveness of the national strategy and its individual components.

A national strategy for building competence in the area of nuclear and radiation safety which should comprise four distinct interrelated phases has not been developed. These phases are:

- analysis of training needs;
- design of a national training programme in a realistic time frame;
- development and implementation of this programme;
- evaluation of the effectiveness of the national strategy and its individual components

The team took note about past activities that may contribute to developing a national strategy on training and education. Most of these activities were related to the field of nuclear energy while nuclear and radiation safety was not included or covered. MOST developed a comprehensive human resource development program for all ministries and organizations except MOET and EVN. This program is to be included in the national human resources training and education program in the field of atomic energy. The working group for development and implementation of human resources development program in the field of nuclear energy of MOST and other ministries and organizations was established with members from VARANS, VAEA and VINATOM. In cooperation with IAEA, European Commission, Rosatom as well as Japanese, Russian and US regulators VARANS' staff attended training on basic knowledge in nuclear engineering, safety analysis and professional skills for regulators. These training programs are ongoing and will be running for at least in the forthcoming next years. MOET organized a basic training program in Hungary, in which about 120 people were trained.

The future steps towards the national strategy comprise:

- Sending a member of VARANS staff to a dedicated IAEA training on this subject. The member has been assigned and the event has been scheduled in November 2014,

- VARANS will take the lead to prepare national strategy which will assesses training needs of all organisations dealing with nuclear and radiation safety within MOST, i.e. VARANS, VAEA and VINATOM.

Suggestion 28 (S28) is OPEN

EDUCATION AND TRAINING RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S29	**Suggestion:** The relevant authority should approve the draft action plan on "Strengthening capacity in nuclear safety oversight for nuclear power programme in Viet Nam" which address education and training in nuclear safety.

The draft action plan on "Strengthening capacity in nuclear safety oversight for nuclear power programme in Viet Nam" which addressed education and training in nuclear safety at the time of previous mission was changed into a new one. This task was taken by the Ministry of Education and Training (MOET) which, in cooperation with relevant Ministries, is responsible for carrying out the national program for human resource development in the field of nuclear energy. By Decision No 1558/QD-TTg on 18 August 2010, the Prime Minister approved the project "Training and development of human resource in the field of atomic energy". By this it is deemed that the draft action plan was approved as suggested in the 2009 IRRS Mission.

Suggestion 29 (S29) is CLOSED

EDUCATION AND TRAINING RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S30	**Suggestion:** MOST should develop a well defined procedure for certification of E&T centers.

VARANS developed a draft Circular 2014/TT-BKHCN, entitled "Requirements for Radiation Protection Training for Radiation Workers, Radiation Protection Officers and Training Service Providers" is waiting for approval by the Minister of MOST. The team was informed that the training of all occupational exposed workers will become a legal requirement when this new Circular is approved.

The team was informed that the draft Circular specifies:

- The syllabus for 14 training courses, based on the type of activity (medical, industrial, academic) to be carried out.

- Testing to demonstrate comprehension of the material presented.
- Annual updating of information for all occupational exposed workers.
- Re-fresher training and recertification for all occupational exposed workers and Radiation Protection Officers every three years.
- Criteria for training centres and qualifications for trainers to be certified by VARANS as being capable of offering a sufficient training course.

The training courses are offered as a three day session with trainers mostly formerly from VINATOM. Currently there are ten training centres registered with VARANS and their instructors will travel to a specific province to provide the training when required. This ensures that all persons who require the training are given the opportunity to participate. The license for a training center needs not to be renewed, but it can be revoked at any time.

The team noted that the draft Circular is waiting for ministerial approval but that some discontent remains with the proposals in the document with regard to the requirement for refresher training and the qualifications of trainers.

When this circular is passed by the MOST, the suggestion about developing "a well-defined procedure for certification of education and training centers" will be met. This suggestion and this circular are linked to the Suggestion 32 (on syllabus for RPO).

Suggestion 30 (S30) is OPEN

EDUCATION AND TRAINING RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S31	**Suggestion:** VARANS should consider the development of a structured training programme to bridge existing gaps (especially in inspection and review and assessment) in education and training of regulatory staff.

VARANS made a significant step in developing a structured training programme by developing its own human resources development plan with the following contents: (i) Identification of job positions (ii) descriptions of job positions (iii) requirements of qualifications for each position (iv) proposal for the required training programme, including the basic professional training including the intensive and oriented training (1-2 years) as well as on the job training in nuclear developed countries (3 years and more).

This training programme has been presented to the National Nuclear Safety Council for their comments and the final proposal will be sent to the MOST for approval before it is submitted to the Government.

It has to be noted that this training programme is oriented to future development of nuclear power programme and a similarly comprehensive planning document for the area of radiation safety does not exist. It should be considered to develop a similar training programme, but maybe in a lesser scope for non-nuclear power applications. Since this suggestion has been only partially addressed it should remain open.

Suggestion 31 (S31) is OPEN

EDUCATION AND TRAINING RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S32	**Suggestion:** VARANS should develop a standard training programme for RPO.

VARANS has already drafted a circular "Requirements for Radiation Protection Training for Radiation Workers, RPO and Training Service Providers" which was described in Suggestion 30. This circular is to be published soon and contains a training programme (syllabus) for radiation protection officers in the duration of three days.

Since this circular has to be passed by the MOST the suggestion cannot be closed.

Suggestion 32 (S32) is OPEN

9. THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY

ORGANIZATION OF THE REGULATORY BODY: THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R66	**Recommendation:** VARANS should establish and implement a documented management system that is understandable to all of those who will use it, and make it available to all staff to use.

VARANS informed the Team that following the 2009 mission, the establishment and implementation of a management system was vigorously pursued as demonstrated by the issuance of Decision 118, "Decisions on the Issuance of Document on Quality Management System (QMS) According to ISO [International Organization of Standardization] 9001-2208 in Activities of VARANS," and formal certification by ISO in the area of Quality Management Systems (ISO 9001-2008) on October 9, 2013 (Certificate No. 1354/2013). VARANS recognizes that the requirements of GS-R-3 associated with establishing, implementing, assessing, and continually improving a management system extend beyond the scope of ISO 9001-2008 accreditation and as such additional efforts and actions are presently underway to achieve full compliance with GS-R-3. Efforts to date include benchmarking trips to international nuclear authorities with well-established and mature management systems with additional benchmarking trips being considered.

Recommendation 66 (R66) is OPEN

ORGANIZATION OF THE REGULATORY BODY: THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S33	**Suggestion:** VARANS while developing the management system should take account of the graded application of management system and the promotion of safety culture.

VARANS informed the team that appropriate resources are deployed through a review of the efforts required to accomplish the activities as dictated by the complexity of the activities and the relative experience level of individual staff members performing the activities. As such, other factors in the deployment of resources, such as the hazards and magnitude of the potential impact (risks) associated with the safety, health, environmental, security, quality, and economic elements of each activity had not been considered.

Suggestion 33 (S33) is OPEN

ORGANIZATION OF THE REGULATORY BODY: THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S34	**Suggestion:** VARANS should include a process to identify its stakeholders and their expectations in the management system.

VARANS informed the Team that their internal and external stakeholders had not been formally identified and that specific requirements to measure and assess the expectations of those stakeholders in the management system had not been developed to date. The Team also determined that some limited and specific formal and informal processes for internal and external stakeholders to provide feedback existed. For example, inspection reports concerning the operation of the research reactor include a formal provision for providing feedback to VARANS regarding the findings and observations documented in the inspection report. Also, Section 4, "Rights and Obligations of Inspected Subjects," of Article 57, "Right of Inspected Subjects," of Law of Inspection No. 56/2010/QH12, dated November 15, 2010 contains provisions for the filing of complaints regarding decisions (Pararaph 1b) and compensation for damages (Paragraph 2). VARANS also informed the Team that informal, non-proceduralized mechanisms for stakeholders to provide feedback also existed. For example, VARANS has been in the practice of holding an annual meeting with the Radiation Protection Officers, although this practice has not been proceduralized. Feedback is requested by VARANS staff at these meetings. Similarly, VARANS informed the Team that the opportunity for feedback from the VARANS staff to management through an "open door" policy is widely known, although this policy has not been formalized by procedure.

Suggestion 34 (S34) is OPEN

ORGANIZATION OF THE REGULATORY BODY: THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

ORGANIZATION OF THE REGULATORY BODY: THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S35	**Suggestion:** VARANS, while developing the processes, should take account of the control of documents, products and records.

The control of documents, products, and records is required by the "Procedure for Document Control," issued on May 10, 2013 and the "Procedure for Record Control," issued on May 10, 2013. VARANS staff indicated that an activity to evaluate the compliance of existing procedure with GS-R-3 is underway as discussed in Recommendation 66, but that they had not completed enough of the review to say whether the procedures comply.

Suggestion 35 (S35) is OPEN

ORGANIZATION OF THE REGULATORY BODY: THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S36	**Suggestion:** VARANS in developing its management system ensure that it provides for management at all levels to evaluate the performance of work and the improvement of safety culture, and that it is monitored and measured to confirm that its processes achieve their intended results, and to identify opportunities for improvement**.**

VARANS informed the Team that Law of Inspection No. 56/2010/QH12 provides for the Ministry of Science and Trade (MOST) to review the work performed by VARANS. Similarly, the "Procedure for Internal Audits," dated May 10, 2013, includes a provision for a self-assessment of the effectiveness of VARANS activities related to the Quality Management System (QMS) as required by ISO 9001:2008. However, VARANS informed the Team that in practice a review by MOST of the work performed by VARANS was only conducted if a complaint was received and that self-assessments of the work by VARANS were not routinely accomplished.

VARANS staff expressed a strong desire to develop and issue a Safety Culture policy and there are some indications that substantial progress in this area may be realized. In particular, the Director of the Division of Legislation and Information drafted a paper entitled "VARANS – First Step Towards a Strong Safety Culture," that was presented at an IAEA Safety Culture Assessment Methodology Workshop held November 18-22, 2013. The Team reviewed this paper and found that it provided an accurate and comprehensive description of the principles of a strong safety culture. Despite these positive intentions, a Safety Culture policy has yet to be developed. The VARANS staff informed the Team that the Director of VARANS has directed a Safety Culture policy to be developed and issued by December 31, 2014.

Suggestion 36 (S36) is OPEN

10. SAFETY INFRASTRUCTURE FOR A NATIONAL NUCLEAR POWER PROGRAMME

10.1 Introduction

The IAEA, based on Member State requests, published a document regarding the development of a safety infrastructure for States implementing a nuclear power programme. The document, Safety Guide SSG-16 "Establishing the Safety Infrastructure for a Nuclear power programme." describes the gradual implementation of the IAEA Safety Standards (via Actions) beginning with the State's initial consideration of developing a nuclear power programme (Phase 1) through construction and readiness for commissioning of the NPP (Phase 3).

VARANS, together with other relevant organizations (VAEI, MOIT, EVN and etc),conducted a national self-assessment based on the actions identified in SSG-16 for phases 1 and 2, and provided the information with regard to development of Viet Nam's national nuclear safety infrastructure. The original mission report reviewed the status of Viet Nam's programme in 2009 against a draft of SSG-16 (known as DS-424). This section of the IRRS report addresses the review that was conducted of Viet Nam's progress with respect to safety infrastructure development using SSG-16 as a reference.

Specifically, the review addressed the progress made against the actions expected to be conducted to comply with IAEA Safety Standards by the various organizations (Government, Regulatory Body, Operating Organization, etc.) involved in the development of Viet Nam's nuclear power programme during Phase 2 only. The review included 19 of the 20 areas covered by SSG-16 (Preparation for Commissioning is only applicable in Phase 3 and was not addressed.).

The Recommendations and Suggestions identified during this review were based on existing and draft IAEA Safety Requirements (not DS-424) and are thus referenced as the Basis for each, and reflect the level of completion expected at the end of Phase 2
(Ready to Invite Bids for a NPP).

10.2 SSG-16 Element 01 National Policy and Strategy

NATIONAL POLICY AND STRATEGY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R67	**Recommendation:** The government should ensure that there is appropriate coordination between the government (Ministries), regulatory authorities (VARANS and others as applicable) and the operating organization (EVN) to assure all fundamental safety principles are addressed in the nuclear safety infrastructure.
S37	**Suggestion:** As part of the coordination, the government should conduct assessments of all areas that are required to support the national nuclear safety infrastructure that

are sufficient in detail to develop national action plans.

Phase 2

Action 5. The government should establish a clear national policy and strategy for meeting safety requirements in order to achieve the fundamental safety objective and to apply the fundamental safety principles established in the IAEA Safety Fundamentals [1].

The original IRRS mission noted that the Government had issued a "Strategy for peaceful uses of atomic energy up to 2020" and a Master Plan in 2007 for implementation of the strategy. The government issued an update to the Master Planning (a term applied by Viet Nam to refer to the document containing high level objectives for the implementation of strategy) in 2010 [Ref 957/QD-TTg]. The Master Planning addresses the uses of nuclear energy across several broad sectors of the national economy, including medical, industry and agriculture.

Furthermore, in 2010 the Prime Minister issued a Decision 906/QD-TTg/2010 entitled "Orientations For Planning Nuclear Power Development In Viet Nam Through 2030" which sets out the policy of the government on the introduction of the nuclear power programme.

The original mission reported that a number of projects had been set up to implement the 2007 Master Plan. The follow-up mission noted that some of these projects had been approved and are ongoing while others are being integrated into a new Master Plan that is being developed for nuclear power infrastructure. This Master Plan is being prepared, coordinated by MOST, to define the activities needed by different ministries to develop the infrastructure for nuclear power to meet the requirements of the nuclear power project, including the nuclear safety infrastructure. The draft Master Plan for the Development of Nuclear Power Infrastructure should be finalized and implemented with a high priority in the areas of nuclear safety.

VARANS provided information showing how the application of the IAEA Fundamental Safety Principles is provided for in various legal documents.

Action 6. The government should establish a policy for knowledge transfer for ensuring safety by means of contracts and agreements with organizations in other States that may be involved in the nuclear power programme.

The follow-up IRRS mission team was informed that the government has yet to establish a policy for knowledge transfer. However the government has established MOU/agreements on safety cooperation with many organisations and states that may be involved in the nuclear power programme, including the IAEA, EU, Russia, United States, Japan, and Korea. Human resources training and development is a priority.

The VARANS counterparts expressed their awareness that commitments for knowledge transfer in the contracts and agreements between the relevant Vietnamese organisations and

the foreign vendors of nuclear technology may be important in future to support nuclear safety competence.

Action 7. The government should ensure identification of responsibilities and their progressive allocation to the relevant organizations involved in the development of the safety infrastructure.

The existing Law on Atomic Energy sets out the responsibilities of the various parties engaged with nuclear facilities and activities:

- Article 7 provides for the State management in the field of atomic energy.
- Article 8 provides for functions and responsibilities of the Agency for Radiation and Nuclear Safety (VARANS).
- Article 9 provides for the roles and responsibilities of the National Council on Development and Application of Atomic Energy and the National Nuclear Safety Council.

The IRRS Follow-up mission was informed that additional legal and administrative documents, including Governmental Decree No.70/2010/ND-CP on Nuclear Power Plants promulgated on June 22, 2010, have been issued to specify the responsibilities of various ministries.

Subsidiary plans are being prepared under the coordination of MOST to define the activities by the various ministries to develop the infrastructure for nuclear power.

Action 8. The government should ensure that all the necessary organizations and other elements of the safety infrastructure are developed efficiently and that their development is adequately coordinated.

The original IRRS mission in 2009 was unable to identify the mechanisms by which the activities of the various stakeholders in the development of the nuclear safety infrastructure were coordinated.

In 2010 and 2011, the Prime Minister issued decisions relating to the establishment and operation of "The State Steering Committee for Ninh Thuan Nuclear Power Project" [Ref Decisions 580/QD-TTg of 04/05/2010 and 93/QD-TTg of 17/01/2011]. The State Steering Committee is chaired by the Deputy Prime Minister, with membership from different Ministries and the Ninh Thuan provincial authority. The Committee has the mandate to provide overall coordination among the various stakeholders in the nuclear power programme.

As noted in 2009, the authorities in Viet Nam had previously carried out a number of self-assessments on the existing infrastructure for nuclear and radiation safety. The follow-up mission was informed that the Government of Viet Nam has continued to host assessments of various types, in addition to this IRRS follow up mission, including an IAEA Legislative Assistance Mission and an Integrated Nuclear Infrastructure Review Mission carried out in December 2012.

Actions to address the findings and recommendations from these missions are being incorporated into the plans for development of nuclear power infrastructure mentioned above under Action 5 above.

Although some progress has been made recently in coordinating the development of the needed nuclear safety infrastructure, the detailed implementation plans remain under

preparation. Recommendation 67 remains OPEN. In order to close Recommendation 67, the government of Viet Nam needs to finalize, approve and implement the detailed plans for development of nuclear power infrastructure, including the nuclear safety infrastructure.

Based on the information provided about progress in the areas of self-assessment Suggestion 37 is CLOSED.

Recommendation 67 (R67) remains OPEN and Suggestion 37 (S37) is CLOSED

10.3 SSG-16 Element 02 Global Nuclear Safety Régime

GLOBAL NUCLEAR SAFETY REGIME: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S38	**Suggestion:** The Government should continue efforts to approve and ratify the appropriate and applicable international instruments associated with the development of a nuclear power programme.
S39	**Suggestion:** The regulatory body should ensure that communications are established with all neighbouring countries regarding the development of the nuclear power programme and the sharing of information related to nuclear operating and regulatory experiences.

Phase 1

Action 12. The government should begin a dialogue with neighbouring States regarding its projects for establishing a nuclear power programme.

Viet Nam has actively participated in the following fora: RCAs (Regional Cooperation Agreements), ANSN (Asia Nuclear Safety Network) and RCF (Regulatory Cooperation Forum), through which Viet Nam shared and exchanged its nuclear regulatory experiences as well as its nuclear power programme and related projects.

Phase 2

Action 14. All the relevant organizations should participate in the global nuclear safety regime.

VARANS has been participating in the global nuclear safety regime as evidenced by its participation in the Convention on Nuclear Safety, its continued actions toward signing and ratifying additional international instruments and treaties, and its involvement in many IAEA and international activities (see Action 12 above).

Action 15. The State should become a party to the relevant international conventions, as identified in Phase 1.

Since 2009, Viet Nam has become party to:

- the Convention on Nuclear Safety;
- the Convention on the Physical Protection of Nuclear Materials, and its amendment;

- the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Spent Fuel Management, and
- the Additional Protocol to the Agreement between the Socialist Republic of Viet Nam and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons

Additionally, Viet Nam is currently considering the following international conventions:

- Vienna Convention on Civil Liability for Nuclear Damage.
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention.

Action 16. All relevant organizations should strengthen their cooperation on safety related matters with States with advanced nuclear power programmes.

As noted in 2009, Viet Nam has established bilateral nuclear cooperation agreements with many states. Viet Nam has also been cooperating with several countries with advanced nuclear programmes such as Russia, France, United States, Japan, and Korea for receiving assistance in training and developing nuclear energy and nuclear safety infrastructure. This cooperation is expected to continue.

Suggestion 38 (S38) is CLOSED and Suggestion 39 (S39) remains OPEN

10.4 SSG-16 Element 03 Legal Framework

LEGAL FRAMEWORK: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S40	**Suggestion:** VARANS should make preparations to develop and formalize detailed requirements and guidance regarding the licensing process for the NPP taking into account the various regulatory authorities involved (VARANS, MOIT, MONRE, etc.).

Phase 1

Action 21. The government should consider the process that should be employed to license nuclear facilities in the later stages of the programme.

The 2008 Law on Atomic Energy specifies the authorities and procedures for various Ministries (MOST, MOIT, MONRE, etc.) to issue licences at different stages of the NPP programme. A proposed revision to the Atomic Energy Law has is currently being drafted, but has not yet been adopted by the government, which aims to simplify and strengthen the legal authority of the regulatory body for decision-making related to nuclear safety.

VARANS is currently preparing a Ministerial Circular on Licensing for NPP Construction taking into account the ministerial responsibilities in the current law. VARANS is also preparing the development of internal processes on safety assessment for licensing.

Phase 2

Action 22. The government should enact and implement the essential elements of the legal framework for the safety infrastructure.

The original IRRS mission in 2009 found that Viet Nam had already promulgated many legal documents in the field of atomic energy. The mission also noted that VARANS is developing a roadmap for formulating and issuing further legal documents, and was coordinating with the General Department of Standards, Metrology and Quality to issue technical regulations and standards in order to ensure nuclear safety for all stages of the nuclear power plant programme.

The IRRS Follow-up mission found that VARANS has now issued a number of circulars setting out technical requirements needed for the bidding phase including criteria for site evaluation, for NPP design and for the format and content of the Safety Analysis Report. Further, the IRRS team found that VARANS has prepared a reasonably detailed plan setting out the technical regulations needed for further phases of the programme.

In order to close Suggestion 40, the government of Viet Nam needs to complete the formalization of detailed requirements and guidance regarding the licensing process for the NPP taking into account the various authorities in the regulatory decision making.

Suggestion 40 (S40) remains OPEN

10.5 SSG-16 Element 04 Regulatory Framework

REGULATORY FRAMEWORK: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R68	**Recommendation:** The regulatory body should develop all necessary regulatory requirements and guidance documents (decrees, regulations, circulars, etc.) in an effective and timely manner, including the safety requirements necessary to support the NPP bidding process.
R69	**Recommendation:** The Government should ensure that the decision making function of the regulatory body is effectively independent from the entity having responsibility for operating responsibility of the NPP.

Phase 2

Action 27: The government should establish an effectively independent regulatory body and should empower it with adequate legal authority, technical and managerial competence, and human and financial resources, to discharge its responsibilities in the nuclear power programme.

The issue of the establishment of a regulatory body having adequate authority and independence was addressed also in Recommendation 1 of this report. The Agency's functions and responsibilities are specified in Article 8 of the Law on Atomic Energy. VARANS is responsible for assisting the Ministry of Science and Technology in ensuring nuclear safety. With regard to regulating the proposed NPP's however, according to the Atomic Energy Law and Decree No. 70/2010/ND-CP, the Prime Minister approves the location of an NPP. MOST grants the construction licence after it has consulted MONRE and the National Nuclear Safety Council. MOIT has the responsibility to issue the operating licence after consulting MOST and NNSC although EVN, the NPP operator, is part of MOIT. The independence of regulatory decision making is therefore potentially compromised since responsibilities are fragmented and there is no clear separation of promotional and regulatory activities within the same Ministry.

The IRRS Follow-up mission noted that the revisions to the 2008 Atomic Energy law are undergoing consideration by a drafting committee headed by MOST.

Given the points above, the team considers that amending the law on Atomic energy to address these issues of independence and authority of the regulatory body should be given a high priority.

VARANS is actively involved in establishing and developing the safety infrastructure from the beginning of the nuclear power programme and is actively working with other ministries as necessary. VARANS has developed plans to increase its staffing as well as training of its staff.

Action 28: The government should appoint senior managers and key experts to the regulatory body and should assign to them the responsibility for developing the organization.

The duties and responsibilities of VARANS are listed in Article 8 of the Law on Atomic Energy. The current organizational structure of the regulatory body is defined in MOST Decision 217/2014/QD-BKHCN. Senior managers and key experts have been appointed and have been actively involved in all aspects of the organization. However, the number of staff with significant nuclear experience is small, and human resources will likely pose a significant challenge to VARANS in meeting its regulatory obligations.

Action 29: The regulatory body should consider the various regulatory approaches that are applied for nuclear power programmes of the same size, and should tentatively plan its approach, taking into account the State's legal and industrial practices and the guidance provided in the IAEA safety standards.

VARANS is using input from various sources, including IAEA and regulatory bodies of vendor countries, to develop regulatory documents. Currently, VARANS (MOST) has established a plan and received approval from the Prime Minister for the issuance of regulations, guides, and standards taking into account the safety standards of IAEA and advanced nuclear industry countries such as the United States, France and Japan.

Action 30: The regulatory body should issue regulations and guides specifying the documentation and procedures necessary in the various steps of the licensing process and inspections to be conducted.

In 2013, a Prime Minister Decision was released regarding the development plan for regulations associated with the development of nuclear power in Viet Nam. Official Document No. 248/TTg-KTN, dated 19 February 2013, lays out the legislative agenda,

including timelines, for the development of requirements related to the implementation of nuclear power. Included in Official Document No. 248 are plans for the amendment of the Law of Atomic Energy by 2013, Government Decrees for the policy on training in the nuclear energy field, a list of additional Prime Minister Decisions to be prepared and a list of Circulars that will be developed by ministries associated with the implementation of the nuclear power program.

Progress on meeting the timelines laid out in Official Document No. 248 is reported annually. Currently, the Official Document is under review and VARANS is assisting in the preparation of an updated version of the plan. Some documents will be combined, others added and the schedule for implementation will be adjusted accordingly. As an example, amendments to the Law of Atomic Energy are now expected to be in place until sometime in 2016.

The team was advised that all of the legislative requirements are reviewed on a five-year cycle to ensure that they are kept up to date and reflect current needs.

Since the IRRS mission in 2009, approximately 40 legal and regulatory documents have been issued. More specifically, the necessary regulatory documents for siting evaluation/approval have been issued; comprising 2 Circulars (Ministerial Circulars No. 28/2011/TT-BKHCN issued on Nov 28, 2011 on Nuclear Safety Requirements for Site of Nuclear Power Plant, No. 29/2012/TT-BKHCN issued on Dec 19, 2012 which provides the Content of the Safety Analysis Report used for the Application for NPP Site Approval) and 5 Technical Standards for siting evaluation/approval. MOST issued Circular No. 21/2013/TT-BKHCN on September 12, 2013 providing the Application Technical Standards and Regulations on Nuclear Safety in Siting, Designing, Constructing, Operating and Decommissioning NPP unit. The regulations on safety requirements for FS approval, design approval, construction permit (including NPP bidding process) have also been issues.

Action 31: The regulatory body should specify the safety requirements that should be known for the bidding process.

The safety requirements have been established in accordance with the requirements in the Law on Atomic Energy (Article 48) and the bidding law. Circular 30/2012/TT-BKHCN was approved establishing design requirements for the NPP. The detailed process for developing the bid is described in the Feasibility Study report.

Action 32: The regulatory body should begin establishing suitable working relationship with the operating organization and international organizations.

The regulatory body has maintained good working relationships with various international organizations (e.g. IAEA). The regulatory body appears to have maintained a good working relationship and cooperation with EVN for the NPP project.

Recommendation 68 (R68) is CLOSED and Recommendation 69 (R69) remains OPEN

10.6 SSG-16 Element 05 Transparency and Openness

TRANSPARENCY AND OPENNESS:
RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

TRANSPARENCY AND OPENNESS: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S41	**Suggestion:** VARANS and MOIT should continue to develop mechanisms to communicate with relevant parties on information regarding regulatory judgements and decisions and their bases; and to receive opinions from interested parties as may be considered appropriate and necessary to carry out its regulatory functions.
S42	**Suggestion:** VARANS should begin to define mechanism(s) to communicate information regarding incidents, accidents, abnormal occurrences or other appropriate information to relevant interested parties (e.g. authorized parties, governmental bodies, national and international organizations, the public, etc.).
S43	**Suggestion:** MOIT (EVN) should amplify the current processes to inform the public about the possible radiation risks associated with a facility.
R70	**Recommendation:** VARANS should establish the appropriate legal document(s) to formalize the authorized party's obligation for communicating with the public regarding a facility's radiation risk.

Phase2

Action 41. The Government should inform all interested parties regarding the safety implications of the decision on the implementation of a nuclear power programme.

Action 42. All relevant organizations should continue to inform the public and interested parties on safety issues, including the expected health and environmental impacts of a nuclear power programme.

In the Governmental Decree No. 07/2010/ND-CP dated on January 25, 2010 detailing and guiding a number of articles of the Law on Atomic Energy, communication mechanism are defined (Articles 6, 7, and 11).The public has been informed of the nuclear power programme through exhibition activities and news releases and articles. Public opinions regarding the nuclear power project have been informally surveyed and collected by VAEI. More formal input has been received through meetings arranged by the Provincial People's Councils. VARANS is evaluating the possibility of using social media networks to communicate with the public regarding information related to the nuclear power programme.

VARANS organized a workshop with IAEA regarding the identification of stakeholder of involvement in the public communication. The IRRS team evaluated that VARANS has made considerable improvement in this area. VARANS, EVN and other stakeholders have conducted multiple public meetings and workshops to inform the public about the nuclear power programme. EVN organized a trip to Japan for a public representative from the Ninh Tuan area to observe the operations of an operating nuclear power reactor. VARANS submitted to the Minister of MOST a draft Circular on Emergency and Preparedness at Provincial and Installation Level. In addition, VARANS is preparing a draft of the PM Decision on Approval of the National Plan for Emergency and Preparedness for Incident at National Level. The IRRS team has noticed that significant progress made in this area.

Suggestion 41 (S41) is CLOSED, Suggestion 42 (S42) is CLOSED and Suggestion 43 (S43): is CLOSED. Recommendation 70 (R70) is CLOSED

10.7 SSG-16 Element 06 Funding and Financing

FUNDING AND FINANCING: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R71	**Recommendation:** The government should define the mechanisms by which all relevant organizations and activities related to nuclear and radiation safety for the NPP project (regulatory body, operating organization, NPP project, education and training centres and programmes, development of industrial capability, research centres, etc.) are provided with adequate financial resources, establishing appropriate priorities.
R72	**Recommendation:** The government should define the mechanisms by which decommissioning and radioactive waste management activities will be provided with adequate financial resources.

Phase 2

Action 52. The government should make provision for long term funding for education and training, and for research centres and other national infrastructure to support the safe operation of nuclear power plants.

Following the Prime Minister Decision No. 1558/QD-TTG approving the scheme on training and development of human resources in the field of atomic energy, the scheme funding structure is as follows:

- During 2010-15: To use 75% of the total funding from the state budget and 25% from other lawful financial sources;
- During 2016-20: To use 50% of the total funding from the state budget and 50% from other lawful financial sources.

Action 53. The government should decide on the mechanism for sustainable funding of the regulatory body.

The Government has no special funding mechanism for the regulatory body. At present, the regulatory body for radiation and nuclear safety is annually funded by the State budget plan, although Finance Minister Decision: Fees and Charges from Radiation Safety and Control Management Activities states that “The State Regulatory Authority in radiation safety and control as stipulated in Decree No.50/1998/ND-CP shall have 85% of the fund from the collected charges to cover the cost in radiation verification activities.” No other special

funding mechanism for the development of the regulatory body for the nuclear power programme has yet been specified.

Action 54. The operating organization should establish a policy for ensuring adequate funding so as not to compromise safety at any stage of the nuclear power programme.

Action 55. The government should enact legislation that requires financial provision for the funding of long term radioactive waste management, spent fuel management and decommissioning.

Articles 36 and 40 in the Law on Atomic Energy stipulate that radiation and nuclear facilities shall bear all the cost associated with dismantlement, and storage and handling of radioactive waste resulted from decommissioning process. Prime Ministerial Decision 09/2014/QD-TTg provides requirements for the funding of decommissioning. Circular 20/2014/TT-BKHCN, dated 25August 2014, sets out requirements for the operator to be responsible for the management of radioactive waste arising from the operation of nuclear facilities.

On the basis of the discussions with VARANS and facts mentioned above, IRRS team evaluated that this issue needs more attention by the Government for defining clear mechanisms regarding assurance of adequate financial resources for safe development of the nuclear power programme in Viet Nam.

Recommendations 71 and 72 (R71/R72) remain OPEN

10.8 SSG-16 Element 07 External Support Organizations and Contractors

EXTERNAL SUPPORT ORGANIZATIONS AND CONTRACTORS: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R73	**Recommendation:** The responsible government entity should determine the organizational location of the technical support resources (inside or outside VARANS) that provide support to the regulatory body, and make arrangements to ensure that there is no conflict of interest with those organizations which provide the regulatory body with technical advice or services.

Phase 2

Action 63. The operating organization and the government should encourage industrial organizations in the State to develop their capabilities with the objective of participating in the construction of nuclear power plants and supporting their safe long term operation.

The Vice Prime Minister agreed, in principle, to use the official development assistance (ODA) from Japanese Government budget to implement this project. At this time, VARANS is elaborating the content of this project before submitting it to the Minister of Science and Technology for approval.. VARANS has progressed in this area with considerable improvements.

Action 64. The government, and the operating organization if applicable, should establish organizations to provide expertise and engineering support or other external support for regulatory oversight and for the safe operation of nuclear power plants, as identified in Phase 1.

VARANS is being provided with expertise from the Viet Nam Atomic Energy Institute (VINATOM), the Institute of Geosciences and Mineral Resources (MONRE), Center on earthquake information and tsunami warning, Institute of Geophysics (Viet Nam Academy of Science and Technology), Institute of Geology (Viet Nam Academy of Science and Technology), Geological Department (University of Mining and Geology), Faculty of Hydrology, Meteorology and Oceanography (University of Sciences, Viet Nam National University) Seismic Division, Institute of Geophysics (Viet Nam Academy of Science and Technology). Three technical centres, have been implemented within VARANS:

- Center for Information and Training;
- Center for Technical Support for Radiation and Nuclear Safety and Emergency Response; and
- Center for Technical Support for Radiation Safety in Ho Chi Minh City.

Action 65. External support organizations and potential contractors should begin to build competence and quality management systems for ensuring safety.

Refer to action 90

Action 66. The regulatory body and the operating organization should plan arrangements for overseeing the activities performed by their respective external support organizations and contractors

VARANS has progressed in this area, but there are no arrangements from VARANS to ensure that there is no conflict of interest within these organizations. VARANS has re-structured to expand its internal technical support capability

Recommendation 73 (R73) remains OPEN

10.9 SSG-16 Element 08 Leadership and Management for Safety

LEADERSHIP AND MANAGEMENT FOR SAFETY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R74	**Recommendation:** VARANS should continue actions to develop and implement a formal management system, including promoting and developing its internal safety culture.
R75	**Recommendation:** *As it is developed, the operating organization (EVN) should take action to ensure that a comprehensive management system is implemented, including development and promotion of safety culture, throughout all phases of the NPP*

project (construction, commissioning, operation, etc.).

Phase 1

Action 74. The government, when identifying senior managers for the prospective organizations to be established, should look for persons with leadership capabilities and an attitude emphasizing safety culture.

VARANS explained to the IRRS team that currently, the selection criteria for senior managers in prospective organizations is leadership capabilities and experience in the relevant field. As far as safety culture attitude is concerned it is a new concept. However, to account for this aspect, a safety culture statement will be issued by the end of this year and the safety culture assessment at VARANS will be conducted in due course. The Government has not made any specific plans to address this issue. Currently, many persons who have demonstrated strong leadership capabilities are nearing retirement age. Most of the remaining staff have been recently recruited and have little experience. This is expected to be a significant challenge to find and recruit sufficient staff with strong leadership capabilities, adequate professional knowledge and experience, and safety minded attitude. The Committee for Safety and Security under the deputy of prime minister is tasked to look for issues regarding security and safety.

Phase 2

Action 75. The regulatory body and the operating organization should start developing and implementing effective management systems in their respective organizations and should promote a strong safety culture.

The Government has approved the State Steering Committee for the Ninh Thuan Nuclear Power Project to function as the Nuclear Energy Programme Implementing Organization (NEPIO) to direct and monitor the progress of all the relevant organizations and Ministries related to the nuclear power programme. Periodic meetings are called by the Deputy Prime Minister who chairs the meeting of relevant Ministries and organizations including MOST, EVN, MOIT, and MOET. Different committees have been formulated; including; safety and security, public communication, and construction under the National Committee for NPP development. The committee on safety and security is responsible to take into account the essential role of leadership and management for safety to achieve a high level of safety and to foster safety culture within organizations. In addition, VARANS has recently received certification for ISO 9001:2008, which is a step toward implementing an integrated management system. However, ISO certification does not include a safety culture component.

Action 76. The regulatory body and the operating organization should develop competences in managing the growth of and change in the organization.

Based on previous experience and activities within VARANS, its organizational structure has been revised by including new divisions, technical support centers and by providing

additional human resources. Presently, VARANS management system complies with ISO 9001-2008. VARANS divisions act by procedure defined by ISO and other regulations, specialized laws, Decrees, and Circulars. VARANS control of documents, products and records is implemented in accordance with ISO 9001-2008. VARANS leadership is now engaging in development of a management system that provides for management at all levels to evaluate the performance of work and the improvement of safety culture, and allows to monitor and measure the results and achievement and to identify opportunities for improvement.

However, during discussions it was evaluated that ISO covers generally the administrative aspects only of some organizations. Moreover, the procedures and systems shown to the review team were related to radiation facilities only. It was concluded and agreed by VARANS that a more focused management system in-line with IAEA Safety Requirement GS-R-3 should be established.

Action 77. The regulatory body and the operating organization should make appropriate arrangements for measurement, assessment (both 'self-assessment' and independent assessment) and continuous improvement of their management systems.

The regulatory body is well aware of the importance of effective management systems and safety culture. VARANS is currently working toward implementing a management system in accordance with GS-R-3, but it needs further assistance guiding implementation. During the course of preparation for ISO certification and IRRS missions, self-assessments were conducted and independent assessments were carried out by these teams. However, the IRRS team noted that no separate group is responsible to perform measurements and self-assessments at VARANS. Moreover, it was agreed by VARANS that there should be some independent group who may look after the Quality Assurance aspects at VARANS. The operating organization, EVN, is in the early stages of development, and has not taken any steps toward implementing a formal GS-R-3 Management System. However, EVN is also ISO certified. During interview, EVN showed commitment to establishing a Management System in line with GS-R-3 requirements with the assistance of IAEA.

Recommendation 74 (R74) remains OPEN and Recommendation 75 (R75) remains OPEN

10.10 SSG-16 Element 09 Human Resources Development

HUMAN RESOURCES DEVELOPMENT: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R76	**Recommendation:** The applicable Ministries should authorize and implement actions to identify gaps in competences, and to increase and maintain the competence of the staff of VARANS, EVN and other organizations involved in safety of the nuclear power programme. Training programmes should be established as necessary to address the identified gaps. Resources should be made available to develop the necessary competence of the regulatory body staff.
R77	**Recommendation:** The regulatory bodies (VARANS and MOIT) should be given the authority to recruit the appropriate number of staff to be able to competently conduct its functions and responsibilities at the appropriate time: legal regulatory document

development, inspections, review and assessment, fulfilment and implementation of the applicable international obligations (conventions, treaties, etc.).

R78 **Recommendation:**

The operating organization (EVN) should be given the authority and resources to recruit the appropriate number of staff to be able to competently conduct its safety responsibilities.

Phase 2

Action 90. All relevant organizations should implement a strategy to attract and retain high quality trained personnel.

According to Prime Minister Decision No. 70/2010/ND-CP dated; 25 January, 2010 regarding "Detailing of implementation of atomic energy law, Article-2, measures to attract human resources in the use of atomic energy", there has been an increase in basic salary for the experts working with such organizations like VARANS, VINATOM and VAEA. The team understands, however, there is still a significant gap between the salaries of the operating organization and the regulatory authorities. While all relevant organizations have implemented a strategy to attract and retain high quality trained personnel, this salary gap could have a negative impact on the regulatory authority's ability to attract appropriate candidates.

Regarding the training and retention strategy, Prime Minister Decision No. 1558/QD-TTG has established the legal basis in this area. Currently, there are 6 universities and 1 training center under VINATOM which is responsible for domestic training and education. Following the Decision No. 1558/QD-TTG dated 18/8/2010, the plan specified that by 2020 sufficient human resources will be trained for management, operations and assurance of safety and security in the field of atomic energy. Salient features include:

- Regarding human resources for nuclear power plants, the plan is to develop on an annual basis 240 engineers with bachelor degrees, 35 masters and doctors (including 20 engineers and bachelors and 15 master and doctors trained abroad) with the goal of by 2020 having train a total of 2400 engineers, 350 masters and doctors in nuclear power specialties;

- Regarding research, application and assurance of safety and security in the field of atomic energy the plan is to train 65 engineers and bachelors, 35 masters and doctors annually (including 30 engineers and bachelors and 17 masters and doctors trained abroad) with the goal of having trained a total of 650 engineers and 250 masters and doctors in the management, application and assurance of safety and security in the field of atomic energy by 2020;

- Human resources for training and teaching: To train 100 new masters and doctors to work as lecturers in training establishments; and

- To send 500 managers and scientists on survey and experience study tours or to join short-term refresher courses or practice trips for professional skill improvement in countries with a developed atomic energy industry.

Action 91. All relevant organizations should support the safety related training of their prospective staff in nuclear organizations in other States.

Senior personnel from different Ministries are sent to foreign countries to participate in technical seminars, conferences, workshops, technical meeting and scientific visits. Through such activities, it is ensured that senior regulators and safety experts maintain their knowledge level and gain an understanding of the principles and criteria of nuclear safety. The university staffs have been trained and most of them were sent to foreign institutions and universities for their master and PhD programs as per Prime Minister Decision.

About 80-100 persons are sent abroad annually for training and approximately 15-20 training courses are carried out in Vietnam. The training program is funded by cooperation projects with foreign organizations

Training programs in cooperation with foreign organizations (including TSOs and RBs) such as NRC, IRSN, GRS, JNES, KINS are being deployed. At present, VARANS has successful cooperation projects with IAEA, EC, Russia, Japan, USNRC, and Korea. Following is a list of some of the technical cooperation:

1. IAEA
   - VIE9/0/10: Strengthening the Technical Capacity of the Regulatory Body for Radiation and Nuclear Safety (completed);
   - VIE9/0/13: Strengthening the Technical Capacity of the Radiation and Nuclear Safety Regulatory Body (completed);
   - VIE9/0/14: Developing a Nuclear Safety Infrastructure for the First Nuclear Power Plant (finishing soon);
   - VIE9/0/15: Strengthening the National Infrastructure and Capacity for Regulating the First Nuclear Power Programme (in progress);
2. EC: VN3-01-09 "Technical assistance for providing the legal framework for nuclear safety and strengthening the capabilities of the regulatory authority of Vietnam and its TSO" (in progress);
3. Rostechnadzor/Rosatom: Memorandum of Understanding on the Cooperation between MOST (Vietnam) and ROSATOM for the year 2012;
4. NRA/JNES: Memorandum of Understanding on the Cooperation between VARANS and JNES for the year 2012;

Action 92. The regulatory body and the operating organization should actively recruit staff so as to ensure capability in areas relevant to safety in a timely manner.

VARANS has developed/drafted an Action Plan on human resource development for the nuclear power plant programme. Currently, VARANS do not have the authority to recruit an appropriate number of staff to perform its functions and responsibilities. However a new project on human resources development of VARANS is under preparation and will be submitted to the minister of MOST as well as other Ministries in 2014.

This VARANS comprehensive “Human Resources “Project” is to be submitted to the Minister of Science and Technology. This project is aiming at compiling all the needs in terms of number of staff and competencies related to the nuclear power programme. The final document should be finalized before the end of 2014 to be presented to the Minister of

Science and Technology, in order to request the corresponding budget. The project document should be updated every year to justify the budget yearly requests. However, this Human Resources Project doesn't cover regulatory functions related to all existing facilities and activities.

The document requests an increase of staff to 115 by 2015 and 250 by 2020, on the basis of an assessment of the work to be carried out in the next years, in particular with the development of a nuclear power programme. Given the large planned expansion of its staff VARANS should ensure an evaluation of the training needed is incorporated in the strategy document.

The Government has increased the number of staff of VARANS, from 63 staff in 2009 to 95 in 2014. However, with the planned transition to "Phase 3" of the Nuclear Programme with a call for bids, additional efforts should be continued and even reinforced to provide VARANS with the necessary skilled staff to meet its statutory responsibilities, in particular to perform safety assessments.

EVN indicated that they have a recruitment plan that is implemented systematically.

Action 93. The government and relevant organizations should establish new institutes or new curricula relevant to safety, as identified in Phase 1.

All identified institutions and universities have been consulted to review their curricula by VAEA in conjunction with VARANS experts and now the current curricula is according to safety requirements. The existing and new institutions which provide trainings related to the nuclear program are being upgraded in terms of laboratory equipment and human resources.

Action 94. All relevant organizations should commence the education and training in academic and vocational institutions of the necessary number of persons for ensuring safety.

Over 20 professionals have obtained their master degrees and PhDs. This year (2014), 8 people are on the plan to have their master and PhD degrees from foreign and local institutions. For more details, please refer to action 90**.**

Recommendation 76 (R76) is CLOSED, Recommendation 77 (R77) remains OPEN and Recommendation 78 (R78) is CLOSED

10.11 SSG-16 Element 10 Research for Safety and Regulatory Purposes

RESEARCH FOR SAFETY AND REGULATORY PURPOSES: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R79	**Suggestion:** The applicable authorities should develop a mechanism to identify key safety areas where research information will be needed to support development of a nuclear power programme.
R80	**Suggestion:** The research organizations, such as VAEI and universities, should self-assess to

identify specific safety areas where their capabilities need to be strengthened to conduct research to support development of a nuclear power programme.

Phase 2

Action 101. The operating organization and the regulatory body should be involved in identifying areas for safety research.

In VARANS, there is no written mechanism to identify key safety areas where research information will be needed to support development of a nuclear power programme. However, at the nuclear safety division of VARANS, to support safety assessment activities, VARANS has identified several key areas on which to concentrate such as thermal-hydraulics, neutron physics, mechanical structure, and severe accidents. VARANS further explained that other related Ministries have their own action plans as a part of Master Plan to identify safety areas for research and they have their own implementation plan approved by relevant Ministers.

This activity is being carried out with limited progress. VARANS and EVN have the opportunity to provide input to VINATOM regarding the identification of research topics, although they have not actively defined safety research areas applicable to the nuclear power programme to VINATOM. Identifying research areas is somewhat limited by the lack of experience of the regulatory staff and anticipated operating organizations.

Action 102. The government should implement plans to establish new institutions for research relating to safety, as identified in Phase 1.

The identification of gaps in the domestic research Centre's capabilities to meet the needs in core areas for the nuclear power programme has been done at a certain level. This is presented in EVN's Pre-feasibility Study report indicating the current status and the need for human resources in the nuclear field. The report has proposed a human resource development programme in the current domestic research centres and universities. However, it does not specify plans for improving these centres, especially for nuclear safety management..

The government is implementing plans to establish new institutions for research relating to safety. Under the framework of the Inter-Governmental Agreement between Viet Nam and Russian Federation, the project on Center on Nuclear Science and Technology will be invested to conduct research to support development of a nuclear power programme. A planned research reactor of 15-20 MW is part of this project. VINATOM is the investor of this Center. In the way of deployment, the new institutions on nuclear safety are within the framework of cooperation with Russia (V-INST) and Korea (V-KINT). Besides that, there are changes in the organization of research activities at some universities to improve research capability on nuclear safety. For example: The Department of Nuclear Power has been created at Electric Power University; The Institute of Nuclear Engineering and Environment at the Hanoi University of Technology has signed a Cooperation Agreement with VINATOM in April 2014.

In addition, the draft Plan for development and improvement of technical capacity of the Regulatory Body (VARANS) is being established with the help of development projects

financed by the ODA fund of the Japanese Government. IRRS team evaluated that considerable work has been done and Viet Nam is moving forward in this area.

Action 103. Research centres should begin conducting research relating to safety in areas in which in-depth knowledge is essential to support safe long term operation of nuclear power plants.

This activity is being conducted with limited results. Research centres have begun conducting research relating to safety in areas in which knowledge in depth is essential to support safe long term operation of nuclear power plants. At VINATOM and some Universities such as the Viet Nam National University, University of Technology, research activities on nuclear safety are being performed. The research projects on nuclear safety have been established and are being implemented. Other research projects of VINATOM at the Ministerial and National level (KC program) on reactor physics, safety analysis (DALAT Nuclear Research Institute/VINATOM and Center of Nuclear Energy – Institute of Nuclear Science and Technology/ VINATOM). IRRS team evaluated that considerable work has been done and Viet Nam is making progress in this area.

Recommendation 79 (R79) is OPEN and **Recommendation 80 (R80) is CLOSED**

10.12 SSG-16 Element 11 Radiation Protection

RADIATION PROTECTION: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R81	**Recommendation:** VARANS in conjunction with applicable ministries should ensure that the principles and criteria for radiation safety regarding workers, the public and the environment for a nuclear power plant are established.
R82	**Recommendation:** EVN should prepare the radiological environmental impact analysis report, as part of the overall site Environmental Impact Assessment, and submit this Assessment to the Ministry of Natural Resources and Environment for review and approval.

Phase 2

Action 108: The regulatory body and/or the government should amend the legislation and/or regulations as appropriate for the purposes of regulating radiation protection.

This activity is under implementation. At present, the regulatory body is actively developing documents guiding the implementation of the Law on Atomic Energy as well as a system of technical standards and regulations on radiation and nuclear safety. The Law on Atomic Energy integrates radiation protection into regulations for safety of the nuclear power plant. Legal documents currently being developed to implement the law take this into account.

Action 109: The regulatory body should establish or approve, as appropriate, the limits and constraints regarding workers and the public both for normal and potential exposure situations in a nuclear power plant.

VARANS (MOST) in conjunction with applicable ministries has issued some regulation documents to ensure that principles and criteria for radiation safety regarding workers, the public and the environment for a nuclear power plant. These documents are:

1. Circular No. 19/2012/TT-BKHCN providing for the control and assurance of radiation safety in occupational exposure and public exposure Circular.

2. Circular No. 30/2012/TT-BKHCN on nuclear safety requirements for design of nuclear power plant.

3. Circular No. 28/2011/TT-BKHCN on nuclear safety requirements for nuclear power plants sites.

4. Circular N0. 08/2014/TT-BKHCN guiding on Safety Assessment Report Review

Article 3 of No. 19/2012/TT-BKHCN provides for the control and assurance of radiation safety in occupational exposure and public exposure. The Circular includes principles for controlling of occupational exposure and public exposure as follows:

a. Organizations and individuals which conduct radiation work have to ensure radiation dose to workers and to member of the public dose do not exceed dose limits are specified in Appendix I attached to this Circular.

b. Organizations and individuals which conduct radiation work have to implement technical and administrative measures to minimize occupational and public dose as low as reasonably achievable (ALARA).

Action 110: The operating organization should update the radiological environmental impact analysis for the selected site, as appropriate.

EVN has prepared the radiological environmental impact analysis report, as part of the overall site Environmental Impact Assessment, and has submitted this Assessment report to the Ministry of Natural Resources and Environment for review and approval. Moreover, it was observed that VARANS has not reviewed and assessed the radiological environmental impact analysis for the selected site.

Action 111: The regulatory body should review and assess the radiological environmental impact analysis for the selected site, as appropriate.

The operating organization (EVN) has submitted detailed EIA to the Ministry of Natural Resources and Environment and is under review by the ministry.
Self-assessment Evaluation: Answered that VARANS carried out review and assessment of environmental impact analysis whereas for practice VARANS has not reviewed the report of EVN report.

Action 112: The operating organization should commence a radiological environmental monitoring programme.

No information was provided.

Action 113: The operating organization should use all appropriate safety principles and requirements and regulatory requirements with regard to radiation protection in preparing the bid specifications for the nuclear power plant.

Details of the bidding process will be included in the Feasibility Study which will be conducted following approval of the Pre-Feasibility Study. The stated intention is to include the appropriate safety requirement into the bidding process documents.

Since the last mission in 2009 there has been a considerable improvement in the legislation for radiation protection with respect to future nuclear power program in Vietnam.

Recommendation 81 is CLOSED and Recommendation 82 is CLOSED

10. 13 SSG-16 Element 12 Safety Assessment

SAFETY ASSESSMENT: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R83	**Suggestion:** The applicable authorities (VARANS, EVN and VAEI) should continue to develop skills associated with conducting and reviewing safety assessments.

Phase 2

Action 118. The operating organization, the regulatory body and external support organizations, as appropriate, should develop the expertise to prepare for the conduct or review of safety assessments.

The 2009 IRRS Mission noted that the capability to conduct safety assessments was under development at that time.

The Follow-up mission found that VARANS has established a new Technical Support Center on Radiation and Nuclear Safety and Emergency Response based on the former Nuclear Safety Division and the former Technical Support Center for Radiation Safety and Emergency Response with 37 staff. Nine technical divisions are planned to be established within this new Center, including the Division of Safety Analysis and Systems, Division of Risk Assessment, Division of Site Evaluation and Structural analysis, Division of Material and Mechanical equipment, Division of I&C, Electrical systems and Fire safety, Division of Radiation Safety, Division of Environmental Radioactive, Division of Rad-Waste & Spent Fuel Safety, Division of Emergency Response, and Division of Safety Transportation.

Existing safety analysis tools at VARANS are as follows:

- Simulator PC-TRAN (provided by IAEA' TC project)
- Neutron calculation: PARCS (CAMP), MCNP
- Thermal Hydraulic: CATHARE2 (Pháp), RELAP5, TRACE (CAMP);
- Radioactive dispersion and dose estimation
- Radioactive dispersion in air: Hysplit 4, IXP (real time calculation), XOQDOQ, CAP88 (in normal operation) and PAVAN (in accidental conditions);
- Radioactive dispersion in water: PCCREAM08 (in normal operation);
- Radiation Shielding: MCNP 5.

- PSA: Risk Spectrum

Besides using international consultants as mentioned above, the Viet Nam Regulatory Body and EVN have already developed their own HRD program including recruitment and training.

During discussions, the team evaluated that VARANS, on behalf of Government, is well aware of IAEA safety standards and with other states practices.

IRRS team evaluated that VARANS has made a considerable progress in the right direction regarding development of expertise to conduct review of safety assessments. In addition, they further explained that EVN has well defined training program and is approved by the Prime Minister. EVN has sent its technical staff to Japan AND Russia for relevant trainings. Moreover, VARANS, EVN and VAEI have regular meetings to discuss training needs and related issues.

Recommendation 83 (R83) is CLOSED

10.14 SSG-16 Element 13 Safety of Radioactive Waste, Spent Fuel Management and Decommissioning

SAFETY OF RADIOACTIVE WASTE, ,SPENT FUEL MANAGEMENT AND DECOMMISSIONING: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R84	**Recommendation:** VARANS and MOST should cooperate with other relevant governmental bodies to issue a national strategy plan for a sustainable management of radioactive wastes, including those for the proposed nuclear power programme.

Phase 2

Action 124. The government and other interested parties as appropriate should establish the national strategy for radioactive waste management, spent fuel management and decommissioning, and should set the goals for its implementation to an appropriate schedule, including site investigations for the purposes of radioactive waste disposal.

The 2009 mission found that the Atomic Energy Law prescribes the basic principles for handling and storage of radioactive waste, disused radioactive sources and spent nuclear fuels

The Follow-up mission was informed that in 2010 the government issued Decision No. 2376/QD-TTG approving the Orientation for Planning Storage and Repository of Radioactive Waste through 2030, with the Visibility through 2050. This document sets out a high-level strategy for radioactive waste management.

Although the previously-planned projects and referred in 2009 have been discontinued, a new implementation plan is being finalized.

Action 125. The government, together with the operating organization, should consider the need for establishing a national organization responsible for radioactive waste management, or for extending the organization for radioactive waste management if this already exists in the State.

It was previously reported in 2009 that the Law on Atomic Energy prescribes that the State shall invest in constructing the national radioactive waste repository and the operating organizations shall be responsible handling and storage of radioactive waste.

During the Follow-Up mission VARANS informed the team that EVN is responsible for management of radioactive waste. VARANS further explained that government intends to establish intermediate and high-level radioactive waste repositories led by the Ministry of Construction in coordination with various other ministries (MOST, MOIT, MONRE etc.).

Action 126. The regulatory body should establish the necessary regulatory requirements on radioactive waste management, spent fuel management and decommissioning, as necessary for bid specifications

The 2008 Law on Atomic Energy contains high-level requirements for storage and disposal of radioactive waste notably the following:

- Article 25.- Disposal and storage of radioactive waste, used radioactive sources and spent nuclear fuel
- Article 36.- Dismantlement and radioactive decontamination of radiation facilities
- Article 40 - Dismantlement and radioactive decontamination of nuclear facilities, disposal of nuclear fuel and equipment and radioactive waste

Article 33 of the Law assigns responsibility to MOST for developing detailed regulations regarding handling and storage of radioactive waste and spent nuclear fuel, requirements for the national radioactive waste storage, and disposal sites of radioactive waste.

VARANS Circular 30/2012/TT-BKHCN issued in 2012 *On Safety Requirements For Design Of Nuclear Power Plants* includes requirements for management of radioactive wastes arising from nuclear power plant operation and decommissioning. Further detailed regulations for national radioactive waste storage and disposal sites remain to be developed.

Action 127. The operating organization should consider the arrangements that are necessary for ensuring the safety of radioactive waste management, the safety of spent fuel management and safety in decommissioning, and for minimizing the generation of radioactive waste.

The IRRS follow up team was informed that EVN is responsible to manage radioactive waste. VARANS further explains that government intends to establish intermediate and high level radioactive waste repository in coordination with civil construction.

Recommendation 84 is closed on the basis of the government has issued Decision No. 2376/QD-TTG approving the Orientation for Planning Storage and Repository of Radioactive Waste through 2030, with the Visibility through 2050. Therefore the strategy has been finalized and an implementation plan is being developed. Recommendation 84 is closed.

Recommendation 84 (R84) is CLOSED

10.15 SSG-16 Element 14 Emergency Preparedness and Response

EMERGENCY PREPAREDNESS AND RESPONSE: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
S44	**Suggestion:** MOST and VARANS should begin to develop the EPR requirements that will be imposed on the NPP operating organization.
S45	**Suggestion:** The operating organization and relevant authorities should begin developing the basic framework for the NPP emergency preparedness programme and plans.

Phase 2

Action 135. The government should specify the national institutions with responsibilities for emergency preparedness and response.

As reported in 2009, Article 83 of the Law on Atomic Energy defines organizations and individuals that are responsible for developing and approving emergency response plans. Article 84 prescribes the responsibilities of relevant organizations and individuals in the case of incidents. There are 3 levels of EPR (national, provincial, and local). The NPP is responsible for developing an emergency response plan for its facility. VARANS is responsible for establishing regulations related to EPR for the NPP.

During discussions with the Follow-Up mission team, VARANS explained the role of different organizations. For example, MOST is responsible for preparation of National radiological and nuclear emergency plan; in consultation with VARANS; MOD is responsible for coordination in case of nuclear or radiation emergency; and the National Committee for Search and Rescue is overall responsible to manage all type of disasters.

Action 136. The government should specify the general approach for emergency preparedness and response on the basis of the probability and severity of the emergency.

As noted in 2009, Article 82 and 83 of the Law on Atomic Energy set out a general approach to emergency preparedness and response based on 5 groups of incidents of varying severity.

Action 137. The government should start implementing new arrangements as identified in Phase 1 for strengthening the infrastructure for emergency preparedness and response.

MOST is developing the National Emergency Response Plan. It is expected that the government will approve the National Plan in 2015. After approval, the government will develop and implement new arrangements for strengthening the infrastructure for emergency preparedness and response. Planned elements include a Circular on radiological and nuclear emergency preparedness and response, a manual for first responders, provincial and facility emergency response plans, technical documents.

Action 138. The regulatory body should develop basic regulations on emergency preparedness and response, as necessary for the development of infrastructure.

In 2009, no requirements had been developed beyond the provisions of the Law on Atomic Energy.

The Follow up Mission was informed that MOST and VARANS have recently issued two related circulars:

- Circular No 16/2013/TT-BKHCN promulgating the National Technical Regulation on the National Network of Radioactive Environmental Monitoring and Warning
- Circular No. 24/2012/TT-BKHCN guiding developing and approving the Radiological and Nuclear Emergency Plan of Facilities and Provinces.

Moreover, by the end of 2014, MOST will issue Circular on general requirement on preparedness and response to radiological and nuclear accidents. After issuance of the above Circular, it is expected that MOST will approve The National Radiological and Nuclear Emergency Plan in 2015.

The IRRS team found that significant progress has been made by the VARANS as new circulars and guidelines for EPR have been issued and VARANS is also working on the National Radiological and Nuclear Emergency Plan.

Action 139. The operating organization should start developing a general emergency preparedness programme for nuclear power plants.

In 2009, the initial requirements had been established in legislation. The follow up Mission found that no further developments have yet taken place in this area. VARANS explained that the licensee/operating organizations will be guided to develop the basic framework for the NPP emergency preparedness programme and plans and technical and human capabilities based on the legal documents which have been issued and those which are planned.

Suggestions 44 and 45 (S44/S45) are CLOSED

10.16 SSG-16 Element 15 Operating Organization

OPERATING ORGANIZATION: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R85	**Recommendation:** The Government, in evaluating the acceptability of the Pre-Feasibility Study, including the Investment Report, should fully recognize the level of financial resources that will be needed to safely develop the nuclear power programme.
S46	**Suggestion:** The Government should start to prepare the construction and operating organizational structures with clear responsibilities for safety.

Phase 2

Action 149. The operating organization should be formed, if it has not already been formed, and it should be expressly assigned its prime responsibility for safety.

EVN has been assigned the responsibility as an operation organization the first nuclear power plant at Ninh Thuan. EVN is aware of its prime responsibility for the safety.

Action 150. The operating organization should appoint managers and key experts, should specify its organizational structure, and should establish its policy for human resources development for discharging its responsibility for safety.

EVN has appointed key managers and experts, has established a well-defined organization structure and has started necessary preparation and planning. EVN will have a construction board namely EVNNPB, having 400 staff, with the responsibility for project management. A preoperational organizational will also be established under the EVNNPB with 1100 employees. EVN has well defined training program and is being executed in an efficient manner. EVN has placed its number of people at Russia and Japan for education and training.

Action 151. The operating organization should establish a management system in which safety has the overriding priority.

In discussions with the Follow-up mission team, EVN showed awareness of the importance of the Management System and is developing Integrated Management system according to MOST Master Plan. Presently, EVN's Nuclear Project Board is ISO 9001:2008 certified and EVN intends to request IAEA assistance for establishment of its Management System according to the requirements of GS-R-3.

Action 152. The operating organization should establish a suitable working relationship with the regulatory body and with relevant national and international organizations.

EVN understands the importance of good working relationship with the regulatory body and other relevant governmental organizations as it is the key of success especially in new nuclear power programmes. EVN appears to have a good working relationship with VARANS, MOST and MOIT.

Action 153. The operating organization should establish a bidding process and should specify the safety requirements to be included in the call for bids, consistent with national regulations.

In November 2011 a State Export Credit Agreement was concluded between the Government of Viet Nam and the Government of the Russian Federation for the Ninh Thuan 1 NPP. For the Ninh Thuan 2 NPP, a State Export Credit Agreement has not yet been completed between the Government of Viet Nam and the Government of Japan.

EVN is a mature organisation with previous experience of procurement on non-nuclear projects. It intends to engage international consultants to support the procurement process.
MOIT issued a set of criteria for the technology selection of Ninh Thuan 1 NPP, taking into account safety requirements which were produced by MOST. EVN will use these criteria as the basis to support bid preparation.

Action 154. The operating organization should make provision to include matters relating to the transfer of safety knowledge in the bid specifications, consistent with governmental policy.
Not reviewed**.**

Recommendation 85 (R85) is CLOSED and Suggestion 46 (S46) is CLOSED

10.17 SSG-16 Element 16 Site Survey, Site Selection and Evaluation

SITE SURVEY, SITE SELECTION AND EVALUATION: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R86	**Recommendation:** VARANS should establish the necessary regulatory requirements necessary for Radiological Environmental Impact Assessment, final site acceptance as well as the process for conducting the regulatory reviews associated with these submittals.

Phase 2

Action 161. The regulatory body should establish specific safety requirements for site evaluation, including requirements for the process for authorizing the site selected, in compliance with the relevant IAEA safety standards.

During discussions with VARANS, it was explained that new circular No.28/2011/TT-BKHCN related to Nuclear Safety Requirements for NPP sites has been promulgated. This circular specifies nuclear safety requirements for sites and investigations, evaluation of sites and for the stages of NPP site approval.

Circular No. 29/2012/TT-BKHCN, dated 19 December 2012, specifies the format and content of the Preliminary Safety Analysis Report that supports the application for nuclear power plant site approval. This circular requests the Utility to provide environmental impact assessment in both radiological impacts and non-radiological impacts.

Document No.5060/BTNMT-TCMT dated 18/12/2012, by Minister of Natural Resource and Environment provides the technical guidance on Environmental Impact Assessment of Nuclear Power Plans.

Action 162. The operating organization should complete the investigations relating to the acceptability of the candidate sites and should select the preferred candidate site for the first nuclear power plant, making use of specific data, information and studies, and assessments conducted on the fullest possible temporal and spatial scales of investigation.

As reported in 2009, EVN has surveyed the candidate sites for the nuclear power plant and submitted to the Prime Minister the investment report which specifies site selection and assessment of candidate sites utilizing the preliminary selection criteria.

Action 163. The operating organization should prepare the site evaluation report and should submit it to the regulatory body, on the basis of a full assessment of the site selected and including the confirmation of site acceptability and the characterization of the site for the definition of the site related design basis parameters.

The SAR and EIA reports of Ninh Thuan-2 for site evaluation and FS approval have been submitted to VARANS/MOST and MONRE per Decree No. 70/ND-TTG.

Action 164. The regulatory body should review and assess the site evaluation report, and should make a decision regarding the acceptability of the site selected and the site related design bases.

Preparation for the review of the SAR and EIA reports on Ninh Thuan 2 for site evaluation and FS approval are ongoing by VARANS/MOST and MONRE.

Action 165. The operating organization should use all the appropriate information relevant to safety and to regulatory control that is related to or derived from the site assessment to prepare the bid specifications for the nuclear power plant.

After site approval, EVN will take into consideration the relevant information in the bid process

Action 166. The operating organization should start to evaluate and modify the site and radiological environmental monitoring programme as necessary after the site evaluation report has been approved.

The site evaluation report has not yet been approved.

Recommendation 86 (R86) is CLOSED

10.18 SSG-16 Element 17 Design Safety

DESIGN SAFETY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R87	**Recommendation:** The Regulatory Body, in conjunction with other applicable organizations as determined by the government, should establish basic design requirements to support NPP technology selection review and to support bid preparation.
S47	**Suggestion:** The Operating Organization should prepare to provide the appropriate safety design requirement information in the bid such that the vendors have accurate and sufficient information.

Phase 2

Action 172. All the relevant organizations should obtain an in-depth understanding of the safety principles and safety requirements applicable in the design of a nuclear power plant.

The Government and related agencies and organizations have reached a certain level of understanding of safety objectives and how and why safety issues affect the design of the NPP.

VARANS technical staff have obtained an in-depth understanding of the safety principles and safety requirements applicable to the design of a nuclear power plant through participating in training courses related to the design of NPPs in Viet Nam under the framework of the multilateral and bilateral collaboration with IAEA, EC, Japan, Russia, the United States of America; through sharing and gaining knowledge and experiences from international experts during technical meetings and workshops, and through staff secondments to other mature regulatory bodies.

Action 173. The operating organization should conduct a thorough market survey of the available nuclear power technologies and should investigate their safety features.

EVN has studied the market of nuclear power technologies and proposed the methodology for technology selection in the investment report submitted to the Prime Minister.

MOIT issued a set of criteria for the technology selection orientation of Ninh Thuan 1 NPP, taking into account safety requirements which were produced by MOST/VARANS. EVN will use these criteria as the basis to support bid preparation.

Recently, two designs have been considered for Ninh Thuan II NPP.

Action 174. The regulatory body should prepare and enact national safety regulations on design that are necessary for bid specification.

MOST has issued Circular No. 30/2012/QD-BKHCN on safety principles requirements on nuclear safety for the design of NPPs. This Circular is based on the relevant IAEA safety requirements, i.e. Specific Safety Requirements SSR 2/1.

Action 175. The government and the operating organization as applicable should start to implement plans for improving the national technical infrastructure, as necessary, to fill in previously identified gaps in the capabilities necessary for ensuring safety.

The Government has issued a Master Plan and strategy for the nuclear power program taken into consideration all the identified gaps and areas including development of the necessary technical infrastructure in the country.

Action 176. The operating organization should include in the bid specification all the safety and regulatory aspects that should be considered in the design, with account taken of the status of the national technical infrastructure.

EVN is bound to follow the newly issued regulatory requirements given in Circular 30 on safety requirements for the design of NPP during the bidding process. Based on the discussions and issuance of Circular 30 on safety requirements for the design of NPP, the IRRS team evaluated that VARANS has established basic design requirements to support NPP technology selection review and to support bid preparation process.

Recommendation 87 (R87) and Suggestion (S47) are CLOSED

10.19 SSG-16 Element 18 Preparation for Commissioning

Not applicable

10.20 SSG-16 Element 19 Transport Safety

TRANSPORT SAFETY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R88	**Recommendation:** The Government should begin to develop regulations and guidance regarding transport of radioactive material to ensure that activities associated with the developing nuclear programme, including spent nuclear fuel, are included.

Phase 2

Action 190: All relevant organizations should implement a plan to meet the intent of the international safety requirements and start to fill in the gaps identified in Phase 1.

Article 62 of the Law on Atomic Energy prescribes that the organizations and individuals conducting the transport of radioactive materials shall make plans for ensuring safety, security and incident preparedness during transportation.

Ministerial Circular No. 23/2012/TT-BKHCN on the Safe Transport of Radioactive Materials has been revised and guidance on safety transport of radioactive materials, including fissile material and spent fuel are included based on IAEA Specific Safety Requirement SSR-6.

VARANS informed the IRRS team that, at present, there is no specific plan to transport the spent nuclear fuel. However, the recent transport of research reactor fuel was accomplished successfully with the coordination of the police/security agencies, Ministry of Defense and other related agencies. However, no formal MoU/agreements are in place between these government bodies.

Action 191: The regulatory body and organizations in charge of transport should join international associations to enhance mutual support.

In 2009 it was reported that Article 63 of the Law on Atomic Energy prescribes responsibilities of organizations and individuals involved in the transport of radioactive materials. With regard to international associations specifically, this item has not been addressed so far. Therefore, the regulatory body will need to study and propose a plan for participation in international organizations and associations related to transportation.

VARANS reported that it has participated in international activities and networks to provide mutual support and has undertaken activities to share experiences, good practices and lessons learned from the practical application of the current international recommendations and guidelines on safety and security in the transport of nuclear and other radioactive material. Examples of recent activities include the following:

- Regional Meeting on Measures to Enhance the Safe Transport of Radioactive Materials and Sources, Selangor, Malaysia, 26 to 30 March 2014.
- Technical Meeting on the Practical Application of the IAEA's Nuclear Security Recommendations and Guidelines for the Domestic and International Transport of Nuclear and Other Radioactive Material, Vienna, Austria, 10 to 13 June 2014.

Recommendation 88 (R88) is CLOSED

10.21 SSG-16 Element 20 Interfaces with Nuclear Security

INTERFACES WITH NUCLEAR SECURITY: RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R89	**Recommendation:** The organization(s) responsible for security, physical protection, nuclear safety design review, and review and assessment should develop processes to integrate their design and implementation activities such that neither safety nor security is compromised.

Phase 2

Action 194. All the relevant organizations should coordinate safety and security aspects from the early stages of development, establishing maximum synergy and, where necessary, integration.

Different Ministries are in the process of establishing coordination for safety and security of the nuclear power program. The Ministry of Public Security is working on a project on nuclear security which includes the development of legislative infrastructure in the field of nuclear security, capacity building for security of radioactive sources and nuclear material, prevention of illicit trafficking and on the security of nuclear power plants.

The issuance of Circular No. 38/2011/TT-BKHCN is a step in the right direction. More work remains to be done in order to develop the guidance and take steps to implement the Circular and its associated principles.

Action 195. The government should define the responsibilities of the operating organization and other competent authorities in relation to security.

Article 22 of the Law on Atomic Energy prescribes the responsibilities and duties of operating organizations and regulatory bodies (e.g. Ministry of Defence, Ministry of Public Security, VARANS) for security of radioactive sources, nuclear materials and nuclear equipment.

MOST has issued Circular No. 38/2011/TT-BKHCN dated on 30 December, 2011 for operating organizations on requirements for the security of nuclear material and nuclear facilities. It specifies that security measures shall be taken into consideration in the design of nuclear facilities to ensure that those measures, safety measures and safeguards measures do not adversely affect each other and that they are mutually supportive.

Currently, VARANS, with the support from the IAEA is developing requirements for the physical protection systems (PPS) of nuclear facilities, including nuclear power plants and criteria for verification of the PPS to be used in connection with the safety analysis assessment of NPPs.

Action 196. The government should develop mechanisms to communicate to the public appropriate information regarding safety and nuclear security.

The Government has established a high level subcommittee under the Steering Committee, as per the Decision of the Prime minister on education and information to the public. In addition, EVN is establishing an information center in the Ninh Thuan Province that will provide the public with information related to security, nuclear safety, legal requirements, and radiation incidents. In addition, public is informed via newspapers, radio, television; responding to mails inquiring information on radiation safety, especially the cases related to radiation incidents; and public meetings to answer questions from the public. Communication with the public is specified in Articles 57, 84, 85 of the Law on Atomic Energy.

The IRRS team noted that MOST has issued a circular on requirements for the security of nuclear materials and nuclear facilities for operating organizations, and that all relevant organizations appear to be making progress in defining and integrating the relevant processes.

Recommendation 89 (R89) is CLOSED

APPENDIX I - LIST OF PARTICIPANTS

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APPENDIX II - LIST OF PARTICIPANTS AT THE ENTRANCE MEETING

29 September 2014

No	Names	Organization	Position	Contact Details/ Notes
1.	Mr. Dang Thanh Luong	VARANS	Consultant/Former DDG	Dtluong@varans.vn
2.	Mr. Le Quang Hiep	VARANS	DDG	Lqhiep@varans.vn
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20.	Mr. Nguyen Hong Thach	EVN	NPB/EVN	
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APPENDIX III - MISSION PROGRAMME

IRRS MISSION PROGRAMME		
Time	**Contents**	**Notes**
Sunday 28 September		
14:00-17:00	IRRS Team Briefing	**Location:** Hotel meeting room ***Participation:*** - IRRS Team - VARANS observer(s)

Monday 29 September		
09:00-10:30	Entrance Meeting: Opening remarks from Viet Nam Opening remarks from IRRS Team Leader Introductions (IRRS review team; VARANS management team, liaison officer & counterparts, observers)	**Location: MOST Building (Meeting rooms will be confirmed)** ***Participation:*** - VARANS senior management & team - Officials from other Ministries/organizations (MOST, VINATOM, VAEA, MOIT, MONRE, EVN…) - IRRS Team Leader, Deputy Team Leader, IAEA Coordinators, - IRRS Experts& support staff

10:30-11:00	Break	
11:00-12:00	VARANS Presentation (Overview of current situation, highlighting what has changed since 2009 mission)	Location: Persons: Dr Dang Thanh Luong Former DDG of VARANS
12:00-13:00	Lunch	
13:00-14:00	VARANS Presentations on SSG 16 review	**Location:** Persons: Dr Dang Thanh Luong Former DDG of VARANS
14:00-17:00	Interviews: Legislative and Governmental Responsibilities Open: R1, R2, R3, R5, S1, S2 Closed: R4	**Location:** Laurent Kueny, Igor Grlicarev; VARANS: Dinh Ngoc Quang (R1, R2, R3, R4, R5, S1, S2) Dang Thanh Luong (R1, R2, R3, R4, R5, S1, S2)
	Medical Safety Open: R38, S24, R39, R40, R41	Location: Peter Fundarek; Eric Duncan VARANS: Lai Tien Thinh (R38, S24, R39, R40, R41) Le Quang Hiep (R38, S24, R39, R40, R41)
	Interviews: SSG 16 elements 11, 13, 19 Open: R81, R82, R84, R88	**Location:** **Persons:**Kamran Mansoor,

		Haitham Alsenaani VARANS: Lai Tien Thinh (Element 11) Nguyen Duc Thanh (Element 13, R81, R82, R84, R88) Nguyen Viet Hung (Element 19) Dang Thanh Luong (Element 11, 13, 19, R81, R82, R84, R88)
17:00-19:00	IRRS Team Meeting & report writing	Location: Hotel meeting room IRRS Team & VARANS Liaison officer (optional)

Tuesday 30 September		
09:00-12:00	Organization of the Regulatory Body Open: R11, R12, S8, S9, S10, R13 Closed: R10	Location: Igor Grlicarev; Laurent Kueny VARANS: Le Minh Tuan (R10, R11, R12, S8, S9, S10, R13) Nguyen Quoc Anh (R10, R11, R12, S8, S9, S10, R13) Dang Thanh Luong (R10, R11, R12, S8, S9, S10, R13)
	Interviews: Development of Regulations and Guides Open: R20, S20, S21, R21, R37, S22, S23	**Location:** Peter Fundarek; Eric Duncan VARANS: Nguyen Viet Hung (R20, R21), Dinh Ngoc Quang (S20, S21, S22,

		S23) Dang Thanh Luong (R20, S20, S21, R21, R37, S22, S23)
	Interviews: SSG 16 elements 4, 5, 7, 10 Open: R68, R69, S41, S42, S43, R70, R73, R79, R80	**Location:** VARANS: Duong Quoc Hung (Element 4) Dinh Ngoc Quang (Element 5, R68, R69, R70, S41, S42, S43) Nguyen An Trung (Element 7, R73, R79, R80) Le Minh Tuan (Element 10) Le Quang Hiep (Element 5) Dang Thanh Luong (Element 4, 7, 10, R68, R69, S41, S42, S43, R70, R73, R79, R80)
12:00-13:30	Lunch	
13:30-17:00	Interviews: Management Systems for Regulatory Body Open: R66, S33, S34, S35, S36	**Location:** Eric Duncan; Laurent Kueny VARANS: Dinh Ngoc Quang (R66, S33, S34, S35, S36) Le Chi Dung (R66, S33, S34, S35, S36)
	Code of Conduct Open: R58, R60, R62, R63, S27	Location: Peter Fundarek; Igor Grlicarev

	Closed: R59, R61, R64, R65	VARANS: Nguyen Nu Hoai Vi (R58, R59, R60, R61, R62, R63, R64, R65, S27) Dang Thanh Luong (R58, R59, R60, R61, R62, R63, R64, R65, S27)
	Interviews: SSG 16 elements 12, 16, 17 Open: R83, S47 Closed: R86, R87	**Location:** **Persons:** Kamran Mansoor, Haitham Alsenaani VARANS: Nguyen An Trung (Element 12, Element 16, Element 17, R83, S47, R86, R87) Lai Tien Thinh (Element 12 - coordinator) Le Quang Hiep (Element 12, Element 16, Element 17) Dang Thanh Luong(R83, S47, R86, R87)
17:00-19:00	IRRS Team Meeting & report writing	Location: Hotel meeting room IRRS Team & VARANS Liaison officer (optional)

Wednesday 1 October		
9:00-12:00	Authorization by the Regulatory Body Open: S11, R16, R17, S12	**Location:** **Persons:** Eric Duncan

	Closed: R14, R18, Closed with Confidence: R19	Laurent Kueny VARANS: Nguyen Viet Hung (R14, R16,R17, R18, R19, S11,S12) Dang Thanh Luong (R14, R16,R17, R18, R19, S11,S12)
	Interviews: Education & Training Open: S28, S29, S30, S31, S32	**Location:** **Persons:** Igor Grlicarev; Peter Fundarek VARANS: Nguyen Trung Tinh (S28, S29, S30, S31, S32) Le Quang Hiep (S28, S29, S30, S31, S32)
	Interviews SSG 16 elements 1, 2, 3, 6 Open: S37, S39, S40, R71, R72 Closed: R67, S38	**Location:** Ian Grant, Kamran Mansoor, Haitham Alsenaani VARANS: Dinh Ngoc Quang (Element 1, 3, R67), Le Minh Tuan (Element 6, R71, R72)) Le Quang Hiep (Element 2, 3) Dang Thanh Luong (Element 1, 6) Dinh Ngoc Quang (S37, S40) Nguyen An Trung (S38, S39)
12:00	Lunch	

13:30-17:00	Interviews: Responsibilities and Functions of the Regulatory Body Open: S3, S4, R6, S6, S7, R7, R8, R9, Closed:S5	**Location:** Igor Grlicarev; Laurent Kueny VARANS: Dinh Ngoc Quang (S3, S4, S5, R6, S6, S7, R7, R8, R9) Dang Thanh Luong (S3, S4, S5, R6, S6, S7, R7, R8, R9)
	Interviews: Review and Assessment Open: R15, R22, R23, R24, R25, R26, R27, R28, R29	**Location:** Eric Duncan; Peter Fundarek VARANS: Nguyen Viet Hung (R15) Nguyen An Trung (R25, R26, R27, R28, R29) Nguyen Duc Thanh (R22, R23, R24) Dang Thanh Luong (R15, R22, R23, R24, R25, R26, R27, R28, R29)
	Interviews: SSG 16 element 14, 15, 20 Open: S44, S45, R85 Closed: S46, R89 (with confidence)	**Location:** **Persons:**Kamran Mansoor, Haitham Alsenaani VARANS: Tao Xuan Khanh (Element 14) E15 not applicable (moved to 3rd Oct) Nguyen Duc Thanh (S44, S45) Nguyen An Trung (R85, S46)

		Dang Thanh Luong
17:00-19:00	IRRS Team Meeting & report writing	Location: Hotel meeting room IRRS Team & VARANS Liaison officer (optional)

Thursday 2 October		
9:00-12:00	Interviews: Emergency prep & response Open: R42, R43, R46, R47, R48, R49, R51, R53, R54, R56, R57S25, S26 Closed: R44, R45, R50, R52 Closed with confidence: R55	**Location:** Igor Grlicarev; Peter Fundarek VARANS: Tao Xuan Khanh Dang Thanh Luong
	Interviews: Inspection and Enforcement Open: S13, R31, S14, R33, S18, S19, R35 Closed: S15, R32, S16, S17, R34, R36	**Location:** Laurent Kueny Eric Duncan VARANS: Duong Quoc Hung Vuong Huu Tan
	Interviews: SSG 16 elements 8, 9 Open: R76, R77 Closed: R74 No info: R75, R78	**Location:** Persons: Kamran Mansoor, Haitham Alsenaani VARANS: Dinh Ngoc Quang (Element 8) Le Minh Tuan (Element 9, R74, R75, R76, R77, R78)

		Dang Thanh Luong (Element 8, R74, R75, R76, R77, R78) Le Quang Hiep (Element 9)
12:00	Lunch	
13:30-17:00	Interviews: Emergency prep & response (cont)	**Location:** Igor Grlicarev; Peter Fundarek VARANS: Tao Xuan Khanh Dang Thanh Luong
	Interviews: Inspection and Enforcement (cont)	**Location:** Laurent Kueny Eric Duncan VARANS: Duong Quoc Hung Vuong Huu Tan
	Interviews: SSG 16 as necessary Element 15, Element 18 Open: R85 Closed: S46	**Location:** **Persons:** Kamran Mansoor, Haitham Alsenaani EVN MOIT
17:00-19:00	IRRS Team Meeting & report preparation	Location: Hotel meeting room IRRS Team & VARANS Liaison officer (optional)

Friday 3 October		
9:00-12:00		**Location:**

	Follow-up interviews as needed/meeting other organizations/report writing (non-SSG16)	Igor Grlicarev; Laurent Kueny ; Peter Fundarek; Eric Duncan
12:00	Lunch	
13:30-17:00	Interviews: SSG 16 elements 2, 20 Open R89 Follow-up interviews as needed/meeting other organizations/report writing	**Location:** Ian Grant, Kamran Mansoor, Haitham Alsenaani VARANS: Dinh Ngoc Quang (Element 1, 3, R67), Nguyen Nu Hoai Vi (Element 2) Nguyen Nu Hoai Vi (Element 20, R89)
17:00-19:00	IRRS Team Meeting (Hotel) & report preparation	Location: Hotel meeting room IRRS Team & VARANS Liaison officer (optional)

Saturday 4 October		
09:00-17:00	Report writing by IRRS team	Location: Hotel
17:00-19:00	IRRS Team Meeting (Hotel) & report preparation	Location: Hotel meeting room IRRS Team & VARANS Liaison officer (optional)

Sunday 5 October		
	Free day	

Monday 6 October		
9:00-12:00	Follow-up interviews as needed/meeting other organizations/report writing	**Location:** **Persons:**
12:00	Lunch	
14.00-15.00	Meeting with Minister of MOST	Tentatively
15.00-17:00	Follow-up interviews as needed/meeting other organizations/report writing	**Location:** **Persons:**
17:00-19:00	IRRS Team Meeting & report preparation	Location: Hotel meeting room IRRS Team & VARANS Liaison officer (optional)
19:00	Draft zero of report provided to VARANS by email for initial feedback	

Tuesday 7 October		
09:00-12:00	VARANS (and relevant Organizations/ Bodies) to review report	**Location:** MOST **Persons:** **IRRS Team** Officials from other Ministries/organization (MOST, VAEI, VAEA, MOIT, MONRE, EVN?)
	IRRS team discuss any outstanding issues	Location: Hotel meeting room

10.00-11.00	Meeting with Vice Prime Minister	Tentatively
12:00	Lunch	
13:30 – 14:30	VARANS (and other bodies?) present initial comments to IRRS team	**Location: VARANS Team** **Persons:** **IRRS Team** Officials from other Ministries/organization (MOST, VAEI, VAEA, MOIT, MONRE, EVN?)
14:30 – 17:00	IRRS team discuss VARANS comments	Location: Hotel meeting room

Wednesday 8 October		
09:00 – 11:00	IRRS team meeting with VARANS to discuss any outstanding issues	
11:00-12:00	IRRS team work on draft 1.0 of report	
12:00	Lunch	
13:30 – 17:00	IRRS Team finalize version 1.0 of report and email to VARANS	
17:00	Final Team Briefing	
Thursday 9 October		

10:00	Exit Meeting Official handover of mission report Closing ceremony Closing remarks: VARANS, IRRS team leader Closing remarks: IAEA Director Division of Radiation, Transport & Waste Safety	
12:00	Close of mission	

APPENDIX IV - LIST OF MISSION COUNTERPARTS

	IRRS Experts	VARANS Lead Counterpart
1.	**LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES**	
	Laurent Kueny Igor Grlicarev	Dinh Ngoc Quang Dang Thanh Luong
2.	**RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY**	
	Igor Grlicarev Laurent Kenny	Dinh Ngoc Quang Dang Thanh Luong
3.	**ORGANIZATION OF THE REGULATORY BODY**	
	Igor Grlicarev Laurent Kenny	Le Minh Tuan Nguyen Quoc Anh Dang Thanh Luong
4.	**ACTIVITIES OF THE REGULATORY BODY**	
5.	**CONTROL OF MEDICAL EXPOSURES**	
	Peter Fundarek Eric Duncan	Lai Tien Thinh Le Quang Hiep
6.	**EMERGENCY PREPAREDNESS AND RESPONSE**	
	Igor Grlicarev Peter Fundarek	Tao Xuan Khanh Dang Thanh Luong
7.	**CODE OF CONDUCT ON SAFETY AND SECURITY OF RADIOACTIVE SOURCES**	
	Peter Fundarek Eric Duncan	Nguyen Nu Hoai Dang Thanh Luong
8.	**EDUCATION AND TRAINING**	
	Igor Grlicarev	Nguyen Trung Tinh

	Peter Fundarek	Le Quang Hiep
9.	**THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY**	
	Eric Duncan Laurent Kenny	Dinh Ngoc Quang Le Chi Dung
10.	**SAFETY INFRASTRUCTURE FOR A NATIONAL NUCLEAR POWER PROGRAMME**	
	Kamran Mansoor Haitham Alsenaani	Lai Tien Thinh Nguyen Duc Thanh Nguyen Viet Hung Dang Thanh Luong Duong Quoc Hung Dinh Ngoc Quang Nguyen An Trung Le Minh Tuan Le Quang Hiep Nguyen Nu Hoai Vi Tao Xuan Khanh

APPENDIX V - RECOMMENDATIONS (R) AND SUGGESTIONS (S) FROM THE 2014 IRRS MISSION THAT REMAIN OPEN

Section	Module	R/S	Recommendations/Suggestions
1.	LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES	R1	The Government should make legal provisions to clarify and strengthen regulatory independence within and across MOST, MOIT, and MONRE, to ensure there is clear separation between the functions of regulation and promotion or operation of radiation and nuclear activities.
		R2	The Government should ensure that VARANS has adequate staffing and financial resources to discharge their assigned responsibilities, both now and in the future.
		R5	MOST should issue the Circular proposed by VARANS which specifies the procedures and formalities described in Articles 36(5) and 40(5)).
		S1	VARANS should be involved in the development of the national strategy for research and development to improve safety and such research and development should be further expanded.
		S2	Even though the legal basis for liabilities is in place, the proposed draft legal instrument to implement the requirements of the Law on Atomic Energy by Articles (90(2) & 91(3)) should be issued.
2.	RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	S3	The “prime responsibility for safety of the operator” principle, addressed in article 6 of the Law on Atomic Energy, should be more developed and explained in further regulation.
		S4	VARANS should expand its communication and information policies and report to other governmental bodies and to the public on the safety aspects (including health and environmental aspects) of facilities and activities and on its regulatory

Section	Module	R/S	Recommendations/Suggestions
			processes.
		S5	MOST should keep the Government informed about the safety aspects of the DALAT research reactor, due to the role played by the reactor in the supply of radioisotopes for Viet Nam.
		S6	The Government should develop a regulation or an administrative instruction for these areas to clarify the roles and responsibilities, and facilitate more direct communication.
		S7	A regulation should be issued to: - put a process in place for notification of abnormal events, incidents or accidents according to criteria defining the severity of the event; - establish a time limit for notification considering these criteria; - establish a requirement for the operator to report on the events occurring, to the regulatory body within a specified period of time, depending on their severity; - facilitate dissemination.
		R7	VARANS and MOST should cooperate with other relevant governmental bodies to issue a national strategy plan for a sustainable management of radioactive wastes, which defines aims and needs. This plan should appraise the existing management modes of radioactive wastes, identify the foreseeable needs for storage or disposal installations, provide for the implementation of research and studies on the management of radioactive wastes and define roles and responsibilities between State Agencies and Ministries.
		R8	VARANS should takes steps to satisfy themselves that the work of their Technical Support Centre does not lead to conflicts of interest, especially when advice is provided to licencees.
		R9	The Government should conduct a review to determine other places in the regulatory body where there may be conflicts of interest as a result of technical

Section	Module	R/S	Recommendations/Suggestions
			support services, and take action to avoid the conflict.
3.	ORGANIZATION OF THE REGULATORY BODY	R10	MOST should ensure that the reporting lines of its bodies charged with regulatory functions preserve the independence of regulatory decision making from those bodies charged with promotional activities. The same principle should be applied to other relevant Ministries involved in regulatory activities.
		R11	The Government should ensure that the National Council for Nuclear Safety, when advising the Prime Minister and when reviewing and assessing reports made by VARANS, does not relieve VARANS of its responsibility for making decisions and recommendations.
		R12	The Government should ensure that the various regulatory authorities appropriately coordinate their regulatory activities at the national level, including the relevant Councils of the Prime Minister, and also at the provincial level.
		S8	In those areas in which VARANS is not entirely self-sufficient, mechanisms and resources should be provided for VARANS to use external services. Accordingly, they should develop criteria for authorization of external consultants and ensure their independence from the operator.
		S9	Thorough analysis of staffing and qualification needs should be done and this should be reflected in a VARANS management document. The staffing and competence issues should be systematically addressed regularly at least once a year and corrective actions should be adopted.
		S10	VARANS should establish a training programme for its staff on an annual basis paying attention that new staff receives adequate training and address the areas where there is a lack of expertise, e.g. establish on the job training in medical area for inspectors.
		R13	The regulatory body should be provided with the necessary staff with the

Section	Module	R/S	Recommendations/Suggestions
			necessary skills to meet its statutory responsibilities, including staff who are capable of performing safety assessments for the scope of radiation/nuclear infrastructure which exists in the country.
4.	ACTIVITIES OF THE REGULATORY BODY: AUTHORIZATION OF INDUSTRIAL AND RESEARCH FACILITIES AND ACTIVITIES	R20	VARANS should develop a set of detailed regulations, clearly defined procedures and guidance documents to establish a comprehensive process to issue, amend and revoke authorizations for nuclear facilities. The regulation process should ensure that all aspects of safety, including limitation of releases of radioactive material in the environment and environmental monitoring, are covered.
		R21	The regulation should provide criteria to define the modifications of nuclear facilities subjected to a review and assessment and to authorization by the regulatory body, with the potential magnitude and nature of the associated hazard being taken into account.
		R24	The review and assessment process should be based on a graded approach i.e.: one that takes into consideration the potential magnitude and nature of the hazard, and for medical practices the processes should include specific considerations for the protection of patients.
		R25	VARANS should define a review and assessment process taking into account the different stages e.g. the design, construction, commissioning, operation and decommissioning of research reactor.
		R26	VARANS should develop detailed documents specifying the principles and associated criteria on which judgment and regulatory decisions are made for research reactor and make them available to the operators.
		R27	VARANS should develop capacity for review and assessment of technical submission to determine whether the research reactor complies with the relevant safety objectives, principles and criteria.
		R28	VARANS should develop a detailed programme for review and assessment of research reactor facility so as to follow the development of research reactor from

Section	Module	R/S	Recommendations/Suggestions
			initial selection of site through design, construction, commissioning and operation, to decommissioning and closure.
		R29	VARANS should define the modification process in the review and assessment so that any modification to safety related aspects of research reactor shall be subjected to thorough review and assessment, taking into account the potential magnitude and nature of associated hazard.
		S13	VARANS should be provided with a legal document that specifies clear guidelines that allow for non-reactive, unannounced inspections, at the discretion of VARANS.
		R30	VARANS and DOST should have a more formal, defined process to conduct inspections following the reporting of abnormal occurrences and other incidents, based on the risk posed by the event. Conducting unplanned inspections should not be limited to situations where violations are known to have occurred.
		R31	The regulatory body should be provided with the authority to withdraw an authorization for a period of greater than six months, as may be necessitated by the severity of the noncompliance.
		S15	VARANS should provide specific timelines in which all remedial actions must be taken following the reporting of deviations or violations of minor safety significance on inspection reports. Where the facility cannot carry out the necessary actions in the time period allowed, the facility should report to VARANS on the reasons for failing to respond so that VARANS can decide on the appropriate regulatory follow-up action.
		R33	VARANS should develop specialized on the job training for its inspectors and DOST inspectors of medical facilities.
		S18	For the implementation of the on-the-job training, VARANS should make arrangements with a teaching hospital in order to allow the inspectors to be trained

Section	Module	R/S	Recommendations/Suggestions
			by specialists in the medical uses of radiation, e.g. medical physicists, medical specialists, medical technologists.
5.	CONTROL OF MEDICAL EXPOSURES	S19	VARANS should be provided with a legal document that specifies clear guidelines that allow for non-reactive, unannounced inspections, at the discretion of the VARANS in research reactor.
		R35	VARANS should make the database system for the tracking and trending of inspection findings readily available to all inspectors for use as a trending tool for research reactor and for assisting in inspection planning.
		S20	The draft plans on the development of regulation should be completed to become a National Strategy for the production of regulations and guides and for the revision of existing ones, covering all fields of nuclear safety and radiation safety controlled by VARANS. This strategy should include the following elements: • determination of the need for the new regulations or the revision of the existing documents, including all relevant information; • setting the priority for development of the regulations; • determination of the scope of the proposed regulations or revisions; and • determination of the resources to be employed, depending on the resources available and on the time-scale for the preparation and establishment of regulations and guides. • the necessary time for implementing the new regulations.
		S23	VARANS should benchmark the different existing regulatory system regarding nuclear facilities to develop its own regulatory approach, with an appropriate balance between performance based and prescriptive regulations, before developing detailed regulations and standards.
		S24	VARANS should assume a proactive role in fostering the cooperation among the Vietnamese regulatory authorities and the Ministry of Health providing sound

Section	Module	R/S	Recommendations/Suggestions
			information on the risks derived from the lack of regulatory control of medical exposures and offering assistance in drafting the regulations that allow to implement the requirements of the Standards.
		R39	The Government through the appropriate authorities should develop a comprehensive programme for providing adequate and specific training at least to the following persons: • Physicians who are responsible for individual justification and conducting the exposures • Radiation technologists or equivalent staff and other relevant health professionals.
		R40	The Government, through the appropriate authorities, should develop a national strategy for building competence in the Medical Physics area and establish formal means for accrediting qualifications.
		R41	The Government, through the appropriate bodies, should expand the programmes under development for performing comprehensive surveys of patient doses with special focus on CT and interventional radiology, and to engage professional societies in developing and implementation of Diagnostic Reference Levels (DRLs).
		R42	VARANS should write a National Radiological Emergency Plan and the task should be finished in a reasonable timeframe.
		R43	Threat assessment shall be performed by VARANS for all radioactive sources and installations in Viet Nam for the full range of postulated events taking into account their probability of occurrence.
		R45	An emergency classification system should be in place which would enable prompt initiation of co-ordinated and pre-planned emergency response on and off

Section	Module	R/S	Recommendations/Suggestions
6.	EMERGENCY PREPAREDNESS AND RESPONSE		the site.
		R46	For the sake of consistency with international standards, the operational intervention levels (OILs) should be adopted by VARANS and arrangements for their implementation made.
		S25	Responsibilities for decision-making regarding agricultural countermeasures and food consumption in the event of an emergency should be clearly addressed in the national emergency plan. Also sampling procedures for food, crops, and agricultural soil in the event of an emergency should be included in the appropriate procedure and the measuring capabilities designated.
		R47	All relevant organizations should take part in the development of emergency response management and operations organization, and implement a command and control system for adequate response to a nuclear or radiological emergency.
		R48	VARANS should initiate the establishment of a network of notification points across the country that includes radiological emergencies.
		S26	This network can be used to receive notification and to initiate the off-site response to an emergency of any type (conventional, nuclear or radiological).
		R49	Viet Nam should establish its Early Notification Contact Point in line with the IAEA requirements, including the operation of communication system (ENAC) and taking part in the exercises/tests aimed at testing the system.
		R50	Emergency workers should be designated and informed about risks of radiation exposure in advance and dose limits for emergency workers should be adopted.
		R51	Public information should be addressed in the future documents, i.e. national and provincial emergency plan and relevant procedures. The staff responsible for preparation of press releases should be designated in advance. In addition, the information pathways should be described, outlining which media information should be sent, by which means (facsimile, e-mail, telephone), and identifying the

Section	Module	R/S	Recommendations/Suggestions
			responsible person to authorize and send out this information.
		R52	All emergency response organizations should begin developing procedures for radiological emergency response.
		R54	VARANS should develop a procedure to activate the Technical Support Centre staff in case of an emergency, send its staff to the scene and carry out a response (could be for different scenarios/events). This procedure needs to be exercised before it comes into effect.
		R56	All relevant organizations should take part in testing their emergency response capabilities in an exercise. The exercise should be thoroughly analyzed, and lessons learned should be integrated to improve the emergency response capability.
		R57	The response organizations should include provisions for establishing and maintaining the required quality assurance programme for radiation monitoring instrumentation and other equipment.
7.	CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES	R58	The regulatory body, in conjunction with other Ministries, should begin the promotion of safety culture within the country.
		R60	VARANS should undertake a programme of outreach for police and other emergency responders to ensure that they clearly understand their actions upon the discovery of, or reporting of, an orphan source. This information should include contact information for persons who are available to respond to such events.
		R62	The State should establish a process whereby notification may be made in the event of a situation with potential transboundary implications. The process should include prompt, complete notification of the potentially affected neighbouring States and also provide notification to the IAEA.

Section	Module	R/S	Recommendations/Suggestions
		S27	VARANS should conduct more outreach with scrap metal dealers to ensure they understand the implications of the discovery of an orphan source. In addition, the Government should consider ways of mitigating the costs for scrap metal dealers to obtain the necessary monitoring equipment.
		R64	VARANS should establish a process for providing prior notification of any exporting activity to the corresponding regulatory body of the importing State. VARANS should also establish a process for receiving such notifications from any exporting State.
8.	EDUCATION & TRAINING	S28	VARANS should develop national strategy to ensure that national infrastructures are adequate to provide for education and training of specialists in radiation protection and safety. This national strategy consists of several phases: analysis of training needs; design of a national training programme in a realistic time frame; development and implementation of this programme; evaluation of the effectiveness of the national strategy and its individual components.
		S30	MOST should develop a well defined procedure for certification of E&T centers.
		S31	VARANS should consider the development of a structured training programme to bridge existing gaps (especially in inspection and review and assessment) in education and training of regulatory staff.
		S32	VARANS should develop a standard training programme for RPO.
9.	ORGANIZATION OF THE REGULATORY BODY: THE MANAGEMENT SYSTEM FOR THE REGULATORY BODY	R66	VARANS should establish and implement a documented management system that is understandable to all of those who will use it, and make it available to all staff to use.
		S33	VARANS while developing the management system should take account of the graded application of management system and the promotion of safety culture.

Section	Module	R/S	Recommendations/Suggestions
		S34	VARANS should include a process to identify its stakeholders and their expectations in the management system.
		S35	VARANS, while developing the processes, should take account of the control of documents, products and records.
		S36	VARANS in developing its management system ensure that it provides for management at all levels to evaluate the performance of work and the improvement of safety culture, and that it is monitored and measured to confirm that its processes achieve their intended results, and to identify opportunities for improvement**.**
10.	SAFETY INFRASTRUCTURE FOR A NATIONAL NUCLEAR POWER PROGRAMME	R67	The government should ensure that there is appropriate coordination between the government (Ministries), regulatory authorities (VARANS and others as applicable) and the operating organization (EVN) to assure all fundamental safety principles are addressed in the nuclear safety infrastructure.
		S39	The regulatory body should ensure that communications are established with all neighbouring countries regarding the development of the nuclear power programme and the sharing of information related to nuclear operating and regulatory experiences.
		S40	VARANS should make preparations to develop and formalize detailed requirements and guidance regarding the licensing process for the NPP taking into account the various regulatory authorities involved (VARANS, MOIT, MONRE, etc.).
		R69	The Government should ensure that the decision making function of the regulatory body is effectively independent from the entity having responsibility for operating responsibility of the NPP.
		R71	The government should define the mechanisms by which all relevant organizations

Section	Module	R/S	Recommendations/Suggestions
			and activities related to nuclear and radiation safety for the NPP project (regulatory body, operating organization, NPP project, education and training centres and programmes, development of industrial capability, research centres, etc.) are provided with adequate financial resources, establishing appropriate priorities.
		R72	The government should define the mechanisms by which decommissioning and radioactive waste management activities will be provided with adequate financial resources.
		R73	The responsible government entity should determine the organizational location of the technical support resources (inside or outside VARANS) that provide support to the regulatory body, and make arrangements to ensure that there is no conflict of interest with those organizations which provide the regulatory body with technical advice or services.
		R74	VARANS should continue actions to develop and implement a formal management system, including promoting and developing its internal safety culture.
		R75	As it is developed, the operating organization (EVN) should take action to ensure that a comprehensive management system is implemented, including development and promotion of safety culture, throughout all phases of the NPP project (construction, commissioning, operation, etc.).
		R77	The regulatory bodies (VARANS and MOIT) should be given the authority to recruit the appropriate number of staff to be able to competently conduct its functions and responsibilities at the appropriate time: legal regulatory document development, inspections, review and assessment, fulfilment and implementation of the applicable international obligations (conventions, treaties, etc.).
		R79	The applicable authorities should develop a mechanism to identify key safety areas where research information will be needed to support development of a nuclear

Section	Module	R/S	Recommendations/Suggestions
			power programme.

APPENDIX VI - REFERENCE MATERIAL PROVIDED BY VARANS USED FOR THE REVIEW

ITEM	TÊN VĂN BẢN	TITLE OF DOCUMENT	ISSUANCE DATE	TRANSLATION
	LUẬT	**LAWS**		
1	Luật Năng lượng nguyên tử	Law on Atomic Energy	3/6/2008	x
2	Luật Đầu tư	Law on Investment	1/7/2006	
3	Luật Xây dựng	Law on Construction	26/11/2003	x
4	Luật Bảo vệ môi trường	Law on Environment Protection	29/11/2005	
5	Luật Điện lực	Law on Electricity	3/12/2004	
6	Luật Thanh tra	Law on Inspection	15/11/2010	x
7	Luật Xử lý vi phạm hành chính	Law on Treating Administrative Violations	20/6/2012	

8	Luật khoáng sản	Mineral Law	17/11/201	x
9		Law on National Security	03/12/2014	x
II	**NGHỊ QUYẾT CỦA QUỐC HỘI NATIONAL ASSEMBLY RESOLUTION**	**NATIONAL ASSEMBLY RESOLUTION**		
1	Nghị quyết số 41/2009/QH12 của Quốc hội về chủ trương đầu tư dự án điện hạt nhân Ninh Thuận	Resolution No. 41/2009/QH12 of the National Assembly approving investment in Ninh Thuan nuclear power project	25/11/2009	x
III	**NGHỊ ĐỊNH**	**GOVERNMENTAL DECREES**		
1	Nghị định số 70/2010/NĐ-CP quy định chi tiết và hướng dẫn thi hành một số điều của Luật Năng lượng nguyên tử về Nhà máy điện hạt nhân	Decree No. 70/2010/ND-CP detailing and guiding a number of articles of the Law on Atomic Energy regarding Nuclear Power Plants	22/6/2010	x
2	Nghị định số 07/2010/NĐ-CP quy định chi tiết và hướng dẫn thi hành một số điều của Luật Năng lượng nguyên tử	Decree No. 07/2010/ND-CP detailing and guiding a number of articles of the Law on Atomic Energy	25/01/2010	x

3	Nghị định số 107/2013/NĐ-CP quy định về xử phạt vi phạm hành chính trong lĩnh vực năng lượng nguyên tử	Decree No. 107/2013/ND-CP on Sanctions against Administrative Violations in the Field of Nuclear Energy	20/9/2013	
4	Nghị định số 213/2013/NĐ-CP về tổ chức và hoạt động của thanh tra ngành khoa học và công nghệ	Decree No. 87/2006/NĐ-CP on the Organization and Operation of the Science and Technology Inspectorate	20/11/2013	
IV	**QUYẾT ĐỊNH CỦA THỦ TƯỚNG**	**PRIME MINISTER'S DECISIONS**		
1	Quyết định số 717/QĐ-TTg về việc Sửa đổi, bổ sung một số điều Quy chế hoạt động của Ban chỉ đạo Nhà nước dự án Điện hạt nhân Ninh thuận ban hành theo Quyết định số 93/QĐ-TTg ngày 17 tháng 01 năm 2011 của Thủ tướng Chính phủ	Decision 717/QD-TTg amending some Articles in the Statute of the State Steering Committee for the Nuclear Power Project Ninh Thuan promulgated by the PM Decision No. 93/QD-TTg on 17 January 2011	14/6/2012	
2	Quyết định số 684/QĐ-TTg về việc Sửa đổi, bổ sung Điều 3 Quyết định 580/QĐ-TTg ngày 04 tháng 5 năm 2010 của Thủ tướng Chính phủ về việc thành lập Ban Chỉ đạo nhà nước Dự án điện hạt nhân Ninh Thuận	Decision No. 684/QD-TTg amending Article 3 in the Decision No. 580/QD-TTg by the Prime Minister on 04 May 2010 establishing the State Steering Committee for Ninh Thuan nuclear project	07/6/2012	
3	Quyết định số 1958/QĐ-TTg phê duyệt Quy hoạch chi tiết	Decision No. 1958/QD-TTg approving the detailed master plan on development	04/11/2011	

	phát triển, ứng dụng bức xạ trong y tế đến năm 2020	and application of medical radiology through 2020		
4	Quyết định số 899/QĐ-TTg Phê duyệt Quy hoạch chi tiết phát triển, ứng dụng bức xạ trong khí tượng, thủy văn, địa chất, khoáng sản và bảo vệ môi trường đến năm 2020	Decision No. 899/QĐ-TTg approving the detailed plan on development and application of radiation in meteorology, hydrology, geology, mineralogy and environmental protection through 2020	10/6/2011	
5	Quyết định số 450/QĐ-TTg phê duyệt Đề án "Triển khai các biện pháp bảo đảm an ninh trong lĩnh vực năng lượng nguyên tử	Decision No. 450/QĐ-TTg approving the Project "Implementing measures to ensure the security in the field of atomic energy"	25/3/2011	
6	Quyết định số 127/QĐ-TTg về việc phê duyệt quy hoạch chi tiết phát triển ứng dụng bức xạ trong công nghiệp và các ngành kinh tế - kỹ thuật khác đến năm 2020	Decision No. 127/QD-TTg approving the detail plan for development and application of radiation in industry and other economic – technology branches through 2020	20/1/2011	
7	Quyết định số 93/QĐ-TTg về việc banh hành quy chế hoạt động của Ban chỉ đạo Nhà nước dự án điện hạt nhân Ninh Thuận	Decision No. 93/QD-TTg Promulgating the Statute of the State Steering Committee for the Nuclear Power Project Ninh Thuan	17/01/2011	x
8	Quyết định số 2376/QĐ-TTg về việc phê duyệt Định hướng quy hoạch địa điểm lưu giữ, chôn cất chất thải phóng xạ đến năm 2030, tầm	Decision No. 2376/QD-TTG approving the Orientation for Planning Storage and Repository of Radioactive Waste through 2030, with the Visibility through 2050	28/12/2010	

	nhìn đến năm 2050			
9	Quyết định số 1636/QĐ-TTg phê duyệt Quy hoạch mạng lưới quan trắc và cảnh báo phóng xạ quốc gia đến năm 2020	Decision No. 1636/QD-TTg approving the Master Plan on the National Monitoring Network up to 2020	31/8/2010	
10	Quyết định số 1558/QĐ-TTg phê duyệt Đề án "Đào tạo và phát triển nguồn nhân lực trong lĩnh vực năng lượng nguyên tử"	Decision No. 1558/QD-TTg approving the Project on Training and Development of Human Resources in the Field of Atomic Energy	18/8/2010	x
11	Quyết định số 957/QĐ-TTg phê duyệt Quy hoạch tổng thể phát triển, ứng dụng năng lượng nguyên tử vì mục đích hoà bình đến năm 2020	Decision No. 957/QĐ-TTg approving the Master Plan on Peaceful Development and Utilization of Atomic Energy through 2020	24/6/2010	
12	Quyết định 906/QĐ-TTg ngày 17/06/2010 phê duyệt Định hướng quy hoạch phát triển điện hạt nhân ở Việt Nam giai đoạn đến năm 2030	Decision No. 906/QĐ-TTg approving the Orientation for Planning Nuclear Power Development in Viet Nam through 2030	17/6/2010	
13	Quyết định số 45/2010/QĐ-TTg ban hành Quy chế Hoạt động kiểm soát hạt nhân	Decision No.45/2010/QĐ-TTg promulgating the Regulations on Nuclear Control	14/06/2010	

14 02/6/2010	Quyết định số 775/QĐ-TTg về việc phê duyệt Quy hoạch chi tiết phát triển, ứng dụng bức xạ trong nông nghiệp đến năm 2020	Decision No. 775/QD-TTg approving the Detail Plan for Development, Application of Radiation in Agriculture through 2020	02/6/2010	
15	Quyết định số 580/QĐ-TTg về việc thành lập Ban chỉ đạo nhà nước dự án điện hạt nhân Ninh Thuận	Decision No. 580/QĐ-TTg on establishment the State Steering Committee for Ninh Thuan Nuclear Project	04/5/2010	
16	Quyết định 446/QĐ-TTg thành lập, tổ chức và hoạt động của Hội đồng An toàn hạt nhân quốc gia	Decision No. 446/QĐ-TTg on Establishing and Organisation of the National Council on Nuclear Safety	07/4/2010	
V	**THÔNG TƯ**	**CIRCULARS**		
1	Thông tư số 08/2014/TT-BKHCN quy định nội dung báo cáo phân tích an toàn sơ bộ trong hồ sơ phê duyệt dự án đầu tư xây dựng nhà máy điện hạt nhân	Circular No 08/2014/TT-BKHCN Requirements on the Format and Content of the Safety Analysis Report for Nuclear Power Plants supporting the Application for the Feasibility Study Approval	26/5/2014	X
2	Thông tư số 24/2013/TT-BCT quy định danh mục, quản lý, sử dụng hồ sơ tài liệu liên quan đến nhà máy điện hạt nhân	Circular No 24/2013/TT-BCT providing List, Management and Use of Records and Documents on Nuclear Power Plant	21/10/2013	

3	Thông tư số 23/2013/TT-BCT quy định nội dung, quy trình thẩm định và phê duyệt thiết kế công trình nhà máy điện hạt nhân	Circular No 23/2013/TT-BCT providing Content, Assessment Procedure and Approval Procedure of NPP Design	18/10/2013	
4	Thông tư số 21/2013/TT-BKHCN quy định việc áp dụng tiêu chuẩn và quy chuẩn kỹ thuật về an toàn hạt nhân trong lựa chọn địa điểm, thiết kế, xây dựng, vận hành và tháo dỡ tổ máy điện hạt nhân	Circular No 21/2013/TT-BKHCN providing the Application Tecnical Standards and Regulations on Nuclear Safety in Siting, Designing, Constructing, Operating and Decommissioning NPP unit	12/9/2013	
5	Thông tư số 20/2013/TT-BKHCN quy định quy trình, thủ tục kiểm tra, thanh tra an toàn hạt nhân trong quá trình khảo sát, đánh giá địa điểm nhà máy điện hạt nhân	Circular No 20/2013/TT-BKHCN providing Process and Procedure of Regulatory Inspection on Nuclear Safety in Surveying and Evaluating NPP Site	06/9/2013	
6	Thông tư số 17/2013/TT-BKHCN hướng dẫn thực hiện quy định về khai báo của Nghị định thư bổ sung của Hiệp định giữa nước CHXHCN Việt Nam và Cơ quan Năng lượng nguyên tử quốc tế về việc áp dụng thanh sát theo Hiệp ước không phổ biến vũ khí hạt nhân	Circular No 17/2013/TT-BKHCN on Requirements on Declaration according the Additional Protocol of Safeguards Agreement between the Socialist Republic of Viet Nam and the International Atomic Energy Agency	30/7/2013	X

7	Thông tư số 16/2013/TT-BKHCN ban hành Quy chuẩn kỹ thuật quốc gia về mạng lưới quan trắc và cảnh báo phóng xạ môi trường quốc gia	Circular No 16/2013/TT-BKHCN promulgating the National Technical Regulation on the National Network of Radioactive Environmental Monitoring and Warning	30/7/2013	X
8	Thông tư số 30/2012/TT-BKHCN quy định yêu cầu về an toàn hạt nhân đối với thiết kế nhà máy điện hạt nhân	Circular No. 30/2012/TT-BKHCN providing the Nuclear Safety Requirements for Design of Nuclear Power Plant	28/12/2012	X
9	Thông tư số 29/2012/TT-BKHCN quy định nội dung báo cáo phân tích an toàn sơ bộ trong hồ sơ đề nghị phê duyệt địa điểm nhà máy điện hạt nhân	Circular No. 29/2012/TT-BKHCN providing the Content of the Safety Analysis Report used for the Application for NPP Site Approval	19/12/2012	X
10	Thông tư số 25/2012/TT-BKHCN quy định danh mục và yêu cầu kiểm soát vật liệu và thiết bị trong chu trình nhiên liệu hạt nhân	Circular No. 25/2012/TT-BKHCN providing the List of Material and Equipment in the Nuclear Fuel Cycle and Nuclear Control Requirements	12/12/2012	X
11	Thông tư số 24/2012/TT-BKHCN hướng dẫn lập và phê duyệt kế hoạch ứng phó sự cố cấp cơ sở và cấp tỉnh	Circular No. 24/2012/TT-BKHCN guiding developing and approving the Radiological and Nuclear Emergency Plan of Facilities and Provinces	4/12/2012	
12	Thông tư số 23/2012/TT-BKHCN hướng dẫn vận chuyển an toàn vật liệu	Circular 23/2012/TT-BKHCN guiding the Safe Transport of Radioactive Materials	23/11/2012	X

	phóng xạ			
13	Thông tư số 19/2012/TT-BKHCN quy định về kiểm soát chiếu xạ nghề nghiệp và chiếu xạ công chúng	Circular No. 19/2012/TT-BKHCN providing Occupational and Public Exposure Control	8/11/2012	
14	Thông tư 13/2012/TT-BTC quy định về bảo hiểm bắt buộc, bảo hiểm nghề nghiệp, bảo hiểm trách nhiệm dân sự và bảo hiểm trách nhiệm bồi thường thiệt hại về môi trường đối với tổ chức, cá nhân tiến hành công việc bức xạ	Circular 13/2012/TT-BTC providing Compulsory Professional Insurance, Civil Liability Insurance and Environmental Damage Compensation Liability Insurance applicable to Organizations and Individuals performing Radiation Practices	7/2/2012	
15	Thông tư số 38/2011/TT-BKHCN quy định yêu cầu về bảo đảm an ninh vật liệu hạt nhân và cơ sở hạt nhân	Circular No. 38/2011/-BKHCN providing the Requirements for Ensuring the Security of Nuclear Materials and Nuclear Facilities	30/12/2011	X
16	Thông tư liên tịch 40/2011/TTLT-BLĐTBXH-BYT quy định điều kiện lao động có hại và công việc không được sử dụng lao động nữ, lao động nữ có thai hoặc đang nuôi con dưới 12 tháng tuổi	Joint Circular No. 40/2011-BLDTBXH-BYT providing the Hazardous Working Conditions and Jobs in which Female Employees who are Pregnant or Nursing Children under 12 months are Not Employed	28/12/2011	

17	Thông tư số 28/2011/TT-BKHCN quy định yêu cầu về an toàn hạt nhân đối với địa điểm nhà máy điện hạt nhân	Circular No. 28/2011/TT-BKHCN on Nuclear Safety Requirements for Site of Nuclear Power Plant	28/11/2011	X
18	Thông tư số 02/2011/TT-BKHCN hướng dẫn thực hiện kiểm soát vật liệu hạt nhân, vật liệu hạt nhân nguồn	Circular No. 02/2011/TT-BKHCN guiding on Control of Nuclear Materials, Source Materials	16/3/2011	X
19	Thông tư số 27/2010/TT-BKHCN hướng dẫn về đo lường bức xạ, hạt nhân và xây dựng, quản lý mạng lưới quan trắc và cảnh báo phóng xạ môi trường	Circular No. 27/2010/TT-BKHCN guiding on Radiation and Nuclear Measurements, and Establishment of the Radioactive Monitoring and Warning Network	30/12/2010	
20	Thông tư số 23/2010/TT-BKHCN hướng dẫn bảo đảm an ninh nguồn phóng xạ	Circular No. 23/2010/TT-BKHCN on Ensuring the Security of Radioactive Sources	29/12/2010	X
21	Thông tư số 24/2010/TT-BKHCN ban hành "Quy chuẩn kỹ thuật quốc gia về An toàn bức xạ - Phân nhóm và phân loại nguồn phóng xạ" (QCVN 6:2010/BKHCN)	Circular No. 24/2010/TT-BKHCN promulgating "the National Technical Regulation on Radiation Safety – Categorization and Classification of Radioactive Sources" (QCVN 6:2010/BKHCN)	29/12/2010	
22	Thông tư số 15/2010/TT-BKHCN ban hành Quy chuẩn kỹ thuật quốc gia	Circular No. 15/2010/TT-BKHCN promulgating the National Technical Regulation QCVN 5:2010 - Radiation	14/9/2010	

	QCVN 05:2010 - An toàn bức xạ - Miễn trừ khai báo, cấp phép	protection – Exemption from Notification and Licensing		
23	Thông tư số 08/2010/TT-BKHCN hướng dẫn việc khai báo, cấp phép và cấp chứng chỉ nhân viên bức xạ	Circular No. 08/2010/TT-BKHCN guiding Notification, Issuance of Licenses and Radiation Worker Certificates	22/7/2010	X
24	Thông tư số 76/2010/TT-BTC quy định mức thu, chế độ thu, nộp, quản lý và sử dụng phí, lệ phí trong lĩnh vực năng lượng nguyên tử	Circular No. 76/2010/TT-BTC providing for Fees and Charges in the Field of Atomic Energy	17/5/2010	
25	Thông tư số 13/2009/TT-BKHCN hướng dẫn đánh giá sơ bộ về an toàn hạt nhân đối với địa điểm nhà máy điện hạt nhân trong giai đoạn quyết định chủ trương đầu tư	Circular No. 13/2009/TT-BKHCN guiding on Preliminary Nuclear Safety Assessment for Site of Nuclear Power Plant in the Investment Decision Stage	20/5/2009	X
VI	**TIÊU CHUẨN QUỐC GIA**	**NATIONAL STANDARDS**		
1	Tiêu chuẩn 9641 :2013 ATHN - Khảo sát, đánh giá các hoạt động của con người có khả năng gây ảnh hưởng đối với NMĐHN	National standard 9641 :2013 Nuclear Safety – External Human Induced Events in Site Evaluation for Nuclear Power Plants		X
2	Tiêu chuẩn 9642 :2013 ATHN - Khảo sát, đánh giá	National standard 9642 :2013 Nuclear Safety – Dispersion of		X

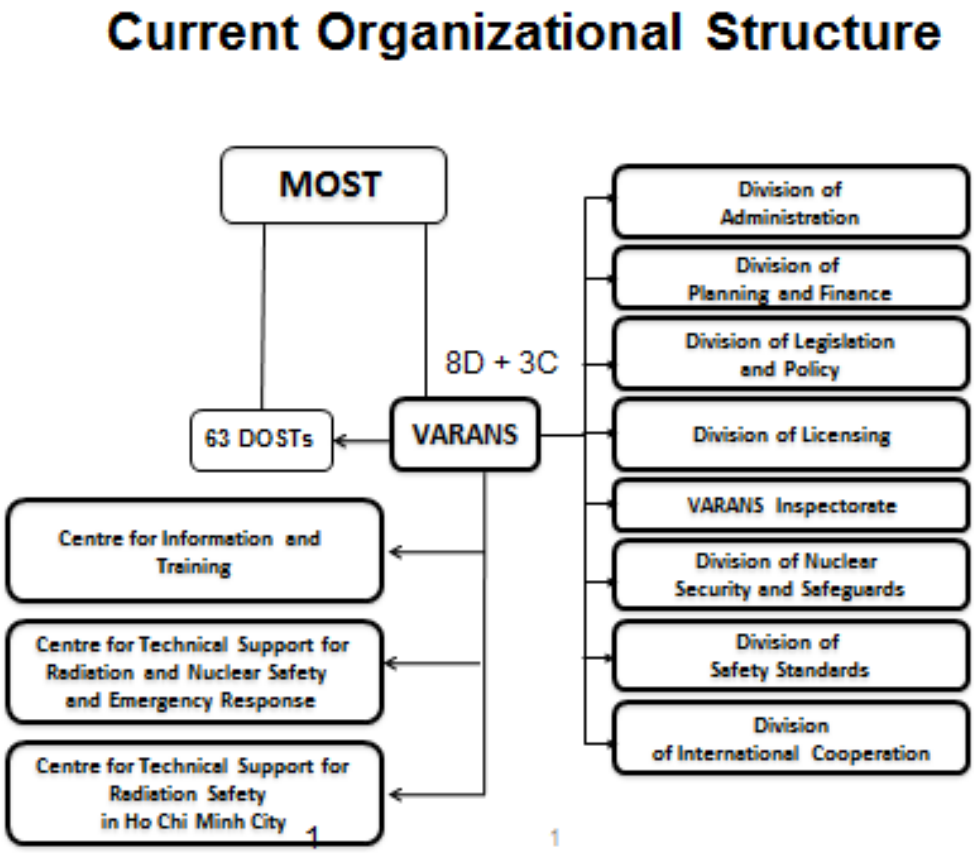
	khả năng phát tán phóng xạ theo không khí và nước trong mối liên quan với phân bố dân cư xung quanh NMĐHN	Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation Nuclear Safety		
3	Tiêu chuẩn 9643 :2013 ATHN - Khảo sát, đánh giá địa kỹ thuật đối với NMĐHN	National standard 9643:2013 Nuclear Safety – Geotechnical aspects of site evaluation and foundations for nuclear power plants		X
4	Tiêu chuẩn 9644 :2013 ATHN - Khảo sát, đánh giá địa chấn đối với NMĐHN	National standard 9644:2013 Nuclear Safety – Seismic hazards in site evaluation for nuclear installations		X
5	Tiêu chuẩn 9645:2013 ATHN - Khảo sát, đánh giá khí tượng, thủy văn đối với NMĐHN	National standard 9645:2013 Nuclear Safety – Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Power Plants Nuclear Safety		X
VII		**OTHER DOCUMENTS**		
		National Nuclear and Radiological Emergency Plan (Draft)		X
		Amendment of Atomic Energy Law (Draft)		X

APPENDIX VII - IAEA REFERENCE MATERIAL USED FOR THE REVIEW

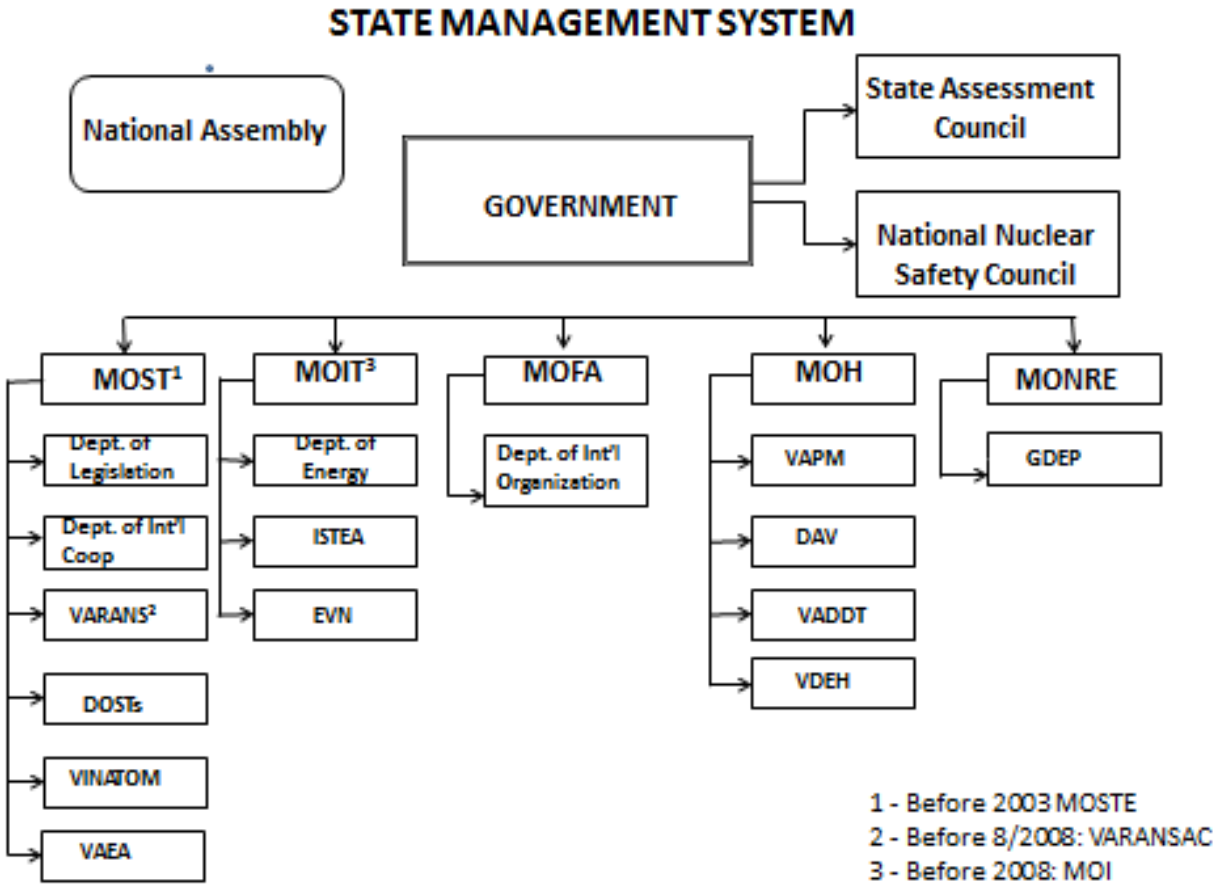
1. **INTERNATIONAL ATOMIC ENERGY AGENCY -** No. SF-1 - FUNDAMENTAL SAFETY PRINCIPLES
2. **INTERNATIONAL ATOMIC ENERGY AGENCY** - GOVERNMENTAL, LEGAL AND REGULATORY FRAMEWORK FOR SAFETY, General Safety Requirement Part 1 (Vienna2010)
3. **INTERNATIONAL ATOMIC ENERGY AGENCY** - PREPAREDNESS AND RESPONSE FOR A NUCLEAR AND RADIOLOGICAL EMERGENCY, Safety Requirement Series No. GS-R-2 IAEA Vienna (2002)
4. **INTERNATIONAL ATOMIC ENERGY AGENCY** THE MANAGEMENT SYSTEM FOR FACILITIES AND ACTIVITIES. Safety Requirement Series No. GS-R-3 IAEA, Vienna (2006)
5. **INTERNATIONAL ATOMIC ENERGY AGENCY** – RADIATION PROTECTION AND SAFETY OF RADIATION SOURCES: INTERNATIONAL BASIC SAFETY STANDARDS, General Safety Requirements Part 3, No. GSR Part 3 (Interim Edition), IAEA, Vienna (2011)
6. **INTERNATIONAL ATOMIC ENERGY AGENCY** – SAFETY ASSESSMENT FOR FACILITIES AND ACTIVITIES, General Safety Requirements Part 4, No. GSR Part 4, IAEA, Vienna (2009)
7. **INTERNATIONAL ATOMIC ENERGY AGENCY –** PREDISPOSAL MANAGEMENT OF RADIOACTIVE WASTE, General Safety Requirement Part 5, No. GSR Part 5, IAEA, Vienna (2009)
8. **INTERNATIONAL ATOMIC ENERGY AGENCY** – DECOMMISSIONING OF FACILITIES USING RADIOACTIVE MATERIAL SAFETY, Safety Requirement Series No. WS-R-5, IAEA, Vienna (2006)
9. **INTERNATIONAL ATOMIC ENERGY AGENCY** - ORGANIZATION AND STAFFING OF THE REGULATORY BODY FOR NUCLEAR FACILITIES, Safety Guide Series No. GS-G-1.1, IAEA, Vienna (2002)
10. **INTERNATIONAL ATOMIC ENERGY AGENCY** - REVIEW AND ASSESSMENT OF NUCLEAR FACILITIES BY THE REGULATORY BODY, Safety Guide Series No. GS-G-1.2, IAEA, Vienna (2002)
11. **INTERNATIONAL ATOMIC ENERGY AGENCY** - REGULATORY INSPECTION OF NUCLEAR FACILITIES AND ENFORCEMENT BY THE REGULATORY BODY, Safety Guide Series No. GS-G-1.3, IAEA, Vienna (2002)
12. **INTERNATIONAL ATOMIC ENERGY AGENCY** - DOCUMENTATION FOR USE IN REGULATORY NUCLEAR FACILITIES, Safety Guide Series No. GS-G-1.4, IAEA, Vienna (2002)
13. **INTERNATIONAL ATOMIC ENERGY AGENCY**- - ARRANGEMENTS FOR PREPAREDNESS FOR A NUCLEAR OR RADIOLOGICAL EMERGENCY, Safety Guide Series No. GS-G-2.1, IAEA, Vienna (2007)
14. **INTERNATIONAL ATOMIC ENERGY AGENCY –** CRITERIA FOR USE IN PREPAREDNESS AND RESPONSE FOR A NUCLEAR OR RADIOLOGICAL EMERGENCY, General Safety Guide Series No. GSG-2, IAEA, Vienna (2011)
15. **INTERNATIONAL ATOMIC ENERGY AGENCY** - SAFETY OF NUCLEAR POWER PLANTS: DESIGN, Specific Safety Requirement Series SSR-2/1 IAEA, Vienna (2012)

16. **INTERNATIONAL ATOMIC ENERGY AGENCY**– SAFETY OF NUCLEAR POWER PLANTS: OPERATION, Safety Requirement Series No. NS-R-2, IAEA, Vienna (2000)
17. **INTERNATIONAL ATOMIC ENERGY AGENCY** - SAFETY OF RESEARCH REACTORS, Safety Requirement Series No. NS-R-4, IAEA, Vienna (2005.)
18. **INTERNATIONAL ATOMIC ENERGY AGENCY** - PERIODIC SAFETY REVIEW OF NUCLEAR POWER PLANTS, Specific Safety Guide SSG-25, IAEA, Vienna (2013)
19. **INTERNATIONAL ATOMIC ENERGY AGENCY** - A SYSTEM FOR THE FEEDBACK OF EXPERIENCE FROM EVENTS IN NUCLEAR INSTALLATIONS, Safety Guide No. NS-G-2.11, IAEA, Vienna (2006)
20. **INTERNATIONAL ATOMIC ENERGY AGENCY**– ASSESSMENT OF OCCUPATIONAL EXPOSURE DUE TO INTAKE OF RADIONUCLIDES, Safety Guide Series No. RS-G-1.2, IAEA, Vienna (1999)
21. **INTERNATIONAL ATOMIC ENERGY AGENCY** - ASSESSMENT OF OCCUPATIONAL EXPOSURE DUE TO EXTERNAL SOURCES OF RADIATION SAFETY, Guide Series No. RS-G-1.3, IAEA, Vienna (1999)
22. **INTERNATIONAL ATOMIC ENERGY AGENCY** - BUILDING COMPETENCE IN RADIATION PROTECTION AND THE SAFE USE OF RADIATION SOURCES, Safety Guide Series No. RS-G-1.4, IAEA, Vienna (2001)
23. **INTERNATIONAL ATOMIC ENERGY AGENCY** - ESTABLISHING THE SAFETY INFRASTRUCTURE FOR A NUCLEAR POWER PROGRAMME, Specific Safety Guide No. SSG 16, IAEA, Vienna
24. **INTERNATIONAL ATOMIC ENERGY AGENCY –** CLASSIFICATION OF RADIOACTIVE WASTE, General Safety Guide No. GSG-1, IAEA, Vienna (2009)
25. **INTERNATIONAL ATOMIC ENERGY AGENCY –** REGULATORY CONTROL OF RADIOACTIVE DISCHARGE TO THE ENVIRONMENT, Safety Guide Series No. WS-G-2.3, IAEA, Vienna (2000)
26. **INTERNATIONAL ATOMIC ENERGY AGENCY –** SAFETY ASSESSMENT FOR THE DECOMMISSIONING OF FACILITIES USING RADIOACTIVE MATERIAL, Safety Guide Series No. WS-G.5.2, IAEA, Vienna (2009)
27. **INTERNATIONAL ATOMIC ENERGY AGENCY** - CONVENTION ON EARLY NOTIFICATION OF A NUCLEAR ACCIDENT (1986) AND CONVENTION ON ASSISTANCE IN THE CASE OF A NUCLEAR ACCIDENT OR RADIOLOGICAL EMERGENCY (1987), Legal Series No. 14, Vienna (1987).
28. **INTERNATIONAL ATOMIC ENERGY AGENCY** - GENERIC ASSESSMENT PROCEDURES FOR DETERMINING PROTECTIVE ACTIONS DURING A REACTOR ACCIDENT, IAEA-TECDOC-955, IAEA, Vienna (1997).
29. **INTERNATIONAL ATOMIC ENERGY AGENCY -** METHOD FOR DEVELOPING ARRANGEMENTS FOR RESPONSE TO A NUCLEAR OR RADIOLOGICAL EMERGENCY, Emergency Preparedness and Response Series, EPR-METHOD, IAEA, Vienna (2003).
30. **INTERNATIONAL ATOMIC ENERGY AGENCY**, Generic Procedures for Determining Protective Actions during a Reactor Accident, IAEA-TECDOC-955, IAEA, Vienna (1997).

APPENDIX VIII - VARANS NATIONAL REGULATORY BODY



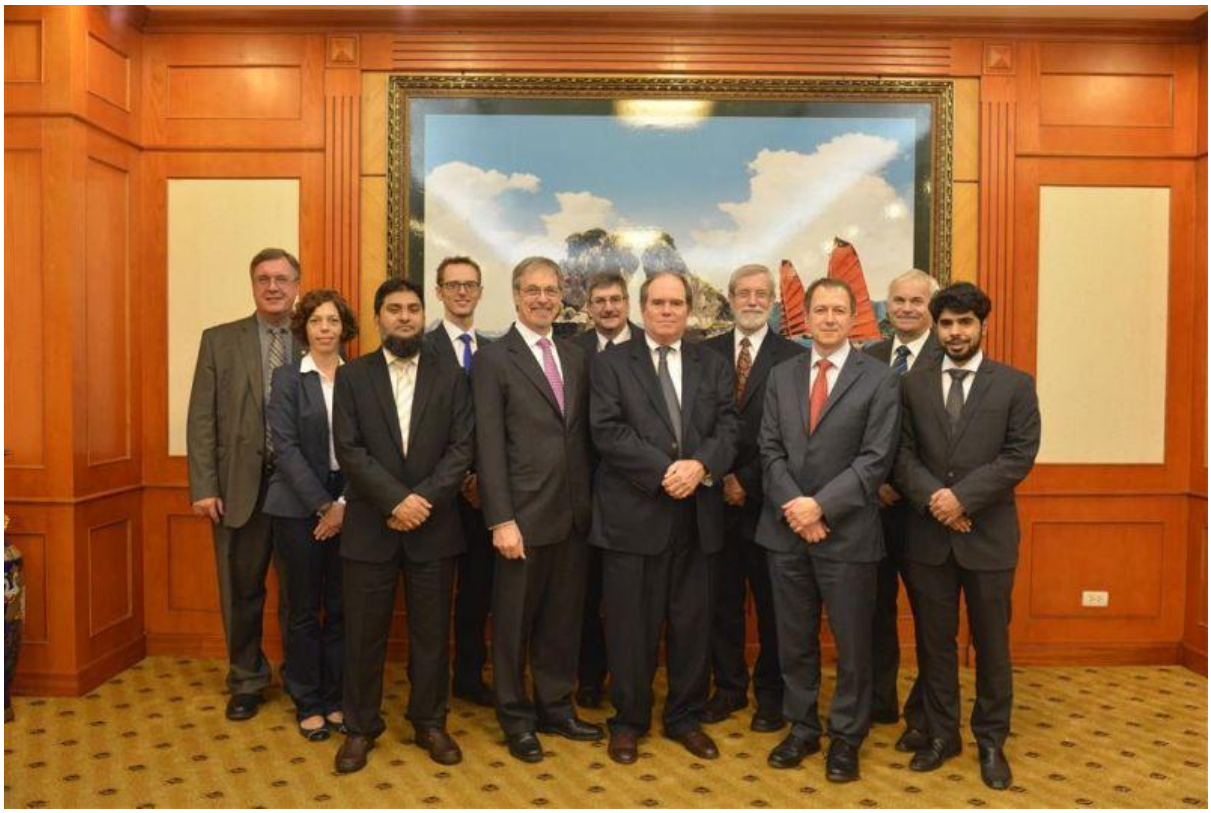
APPENDIX IX - STATE MANAGEMENT SYSTEM



APPENDIX X - LIST OF ABBREVIATIONS AND ACRONYMS

DOH	Department of Health
DOST	Department of Science and Technology
EVN	Viet Nam Electricity
MOC	Ministry of Construction
MOIT	Ministry of Industry and Trade
MOH	Ministry of Health
MONRE	Ministry of Natural Resources and Environment
MOST	Ministry of Science and Technology
NREP	Natioanl Radiological Emergency Plan
PIC	Public Information Center
TSC	Technical Support Center (of VARANS)
TSO	Technical Support Office
VAEA	Viet Nam Atomic Energy Institute
VARANS	Viet Nam Agency for Radiation and Nuclear Safety
VINATOM	Viet Nam Atomic Energy Institute

APPENDIX XI - THE MISSION TEAM



From left to right: Peter Fundarek; Sara Moore; Kamran Mansoor; Laurent Kueny; Ian Grant; Eric Duncan; John Kinneman; David Graves; John Wheatley; Igor Grlicarev; Haitham Alsenaani.