Report on
Regional Training Course on Physical Protection of Nuclear Facilities against Sabotage, Assessing Vulnerabilities and Identification of Vital Areas

November 14-18, 2011, New Delhi, India

Organized jointly by
International Atomic Energy Agency (IAEA) and
Global Centre for Nuclear Energy Partnership (GCNEP), INDIA

CONTENTS

1. INTRODUCTION

This report presents a description of the Regional Training Course on "Physical Protection of Nuclear Facilities against Sabotage, Assessing Vulnerabilities and Identification of Vital Areas" organized at New Delhi during November 14 – 18, 2011. Besides the brief description of the training course, details presented here include list of participants, faculties and the time table. A brief conclusion of the training course is also presented at the end of the report.

2. BRIEF DESCRIPTION OF THE TRAINING COURSE

The Regional Training Course on 'Physical Protection of Nuclear Facilities against Sabotage, Assessing Vulnerabilities and Identification of Vital Areas' was held during November 14 – 18, 2011, at New Delhi. This training course was organized jointly by Global Centre for Nuclear Energy Partnership (GCNEP), Department of Atomic Energy, Government of India and International Atomic Energy Agency (IAEA).

The objective of the training course is to demonstrate methodology of estimation of consequences of sabotage of a nuclear facility, assessment of the relevant PPS vulnerabilities and a systematic process of identification of the vital areas and also to provide IAEA guidance, presented in the relevant draft publications of the nuclear security series.

The course was organized at Hotel Radisson Blu, Paschim Vihar, New Delhi. All the participants, faculty members, IAEA staff members were accommodated in the hotel as the training course was completely residential in nature. The course was held for one week including a day's trip Narora Atomic Power Station. Over the one week there were 14 lecture sessions, 04 workgroup exercise sessions, 02 round table discussion sessions, a feedback session and a field visit to a nuclear power plant, opening and concluding session.

The course was inaugurated by Mr. S. Bhattacharya, Associate Director (T), E&I Group, Bhabha Atomic Research Centre (BARC). Besides the chief guest, other

distinguished guests from Department of Atomic Energy, Government of India, IAEA staff members, faculties from India and abroad were present in the inauguration function.

The course was attended by 17 foreign participants and 8 Indian participants. Amongst foreign participants - 5 were from Indonesia, 3 from United Arab Emirates, 2 each from Thailand, Bangladesh and USA, 1 each from Malaysia, Philipines and Korea. Among Indian participants, 3 were from Bhabha Atomic Research Centre (BARC), 2 from Nuclear Power Corporation of India Ltd. (NPCIL), 1 each from Atomic Energy Regulatory Board (AERB), Bharatiya Nabhikiya Vidyut Nigam Ltd. (BHAVINI), Heavy Water Plant., Kota, Rajasthan, There were two observers from USA Annexure – B gives the list of Indian and foreign participants with their affiliating organization.

The course was organized in 14 lecture sessions, 4 work group exercises and 2 round table discussions. A total of nine faculty members were involved in deliberation of different lectures and present experience of specific country in PPS, conducting round table discussions and work group exercises. Among these nine faculty members, one was from Sandia National laboratory, USA, one IAEA staff member and one from Czech Republic. Six faculty members from India were involved in this training course in lecture presentation. Annexure – A gives the list of foreign and Indian faculty members with their affiliating organization, involved in the course.

Wide ranging topics on physical protection against sabotage were covered in this training course. Some of the important topics covered are:

- Need for physical protection at nuclear facilities
- IAEA Guidelines on physical protection of Nuclear Facilities against sabotage
- Overview of safety concepts important for sabotage consideration
- Identification of areas that must be protected against sabotage
- PPS measures for Protection against sabotage

- Assessment of PPS vulnerabilities
- Measures to mitigate or minimize consequences of sabotage
- Resources required for PPS design and evaluation process for protection of nuclear facilities against sabotage

In addition there were 04 workgroup sessions on different aspects of sabotage protection. The topics covered in work group exercises are –

- Process of identification of areas to be protected against sabotage
- PPS vulnerability assessment
- Measures to mitigate or minimize consequences of sabotage
- Resources required for design of PPS against sabotage

Two round table discussions were held where all faculties and course participants took part overwhelmingly. The topics covered in round table discussions are –

- Sabotage targets and consequences
- Physical Protection Concepts

A volume of course material containing handouts of the presentations, as well as the working group exercises was provided to all the participants. A Course CD containing all the presentations, Nuclear Security Series documents published by IAEA was distributed to all participants and faculties. This CD also contains details of participants and faculty members with their affiliating organization and contact information, photographs of the different sessions and events of the training course.

The course successfully came to an end on 18th November forenoon after a feedback session from the participants. Certificates were distributed to all participants by Mr. B.B.Mithal, Station Director, Narora Atomic Power Station.

3. OBSERVATIONS

The entire training course including the field visit to NAPS (Narora) went on smoothly as per the schedule. Though the field trip to Narora Atomic Power Station was very long, many got an opportunity to visit a nuclear power plant and observe

some of the systems of physical protection. Most participants have suggested that the field trip should extend to one and half day, considering very long travel time. Most of the participants felt that the topics covered are very important and the course will be very useful to them in their working field. All the course presentations were very lively and interactive. Enthusiastic involvement was observed during the entire course from all the faculty members, participants. All the sessions concluded well within the time frame allotted to it.

4. CONCLUSION

The training course was well appreciated by all the participants and faculty members. This is the first time; an RTC on a very current and important subject of sabotage protection was organized in India. All previous RTCs have been organized on physical protection of nuclear material and nuclear facilities or on physical protection of radioactive sources. Considering the new initiative of Global Center for Nuclear Energy Partnership (GCNEP) of Government of India for fostering international collaborative work in training, research and development in the area of nuclear security along with other areas of nuclear energy development and in view of the requirement for knowledge up-gradation in various topical issues of nuclear security, more international and regional courses on Security Culture, Target Identification, Insider Protection, Operation of Physical Protection Systems etc. will be planned in the near future. GCNEP appreciates the cooperation received from IAEA and the international experts on this course.

(G. P. Srivastava)

Course Director

ANNEXURE - A

List of Foreign Faculty Members:

1	Mr.Jindrich Malach	Czech Republic	EBIS, spol. s r.o. Brno, Czech Republic.
2	Mr. Riyaz Natha	USA	Sandia National Laboratories United States of America
3	Mr. V.Kryuchenkov	IAEA	Office of Nuclear Security, International Atomic Energy Agency,

List of Indian Faculty Members :

1	Mr. H. C. Mehta	India	Nuclear Power Corporation of India Ltd., Mumbai – 400094, P
2	Dr. Sanyasi Rao	India	Bhabha Atomic Research Centre Trombay, Mumbai-400085
3	Mr. Fedric Lall	India	Atomic Energy Regulatory Board, Niyamak Bhavan, Anushaktinagar, Mumbai – 400094,
4	Mr. R Kumar	India	Bhabha Atomic Research Centre Trombay, Mumbai-400085
5	Mrs. R.S. Kulgod	India	Bhabha Atomic Research Centre Trombay, Mumbai-400085
6	Mr. Anand Laddha	India	Bhabha Atomic Research Centre Trombay, Mumbai-400085

Annexure – B

List of Foreign Participants with Affiliating Organization

List of Visitors to NAPS Facility

Sr. No	Name	Country	Address and Email
1	**Mr. Md. Monirul ISLAM**	Bangladesh	Bangladesh Atomic Energy Commission (BAEC) Bangladesh
2	**Mr. S. M. Abu ZAHED CHOW**	Bangladesh	Bangladesh Atomic Energy Commission (BAEC) Bangladesh
3	**Mr. JAELANI SAMIUN NARHA**	Indonesia	National Nuclear Energy Agency (BATAN) Indonesia
4	**Mr. Heru PRASETYO**	Indonesia	National Nuclear Energy Agency (BATAN) Indonesia
5	**Mr. Ifieh SAROPIH**	Indonesia	National Nuclear Energy Agency (BATAN) Indonesia
6	**Mr. SISWANTO**	Indonesia	National Nuclear Energy Agency (BATAN) Indonesia
7	**Mr. Kadi SUKADI**	Indonesia	National Nuclear Energy Agency (BATAN) Indonesia
8	**Mr. Sham Smadi Bakri NGAH**	Malaysia	Atomic Energy Licensing Board Malaysia
9	**Mr. Joseph TUGO**	Philippines	Philippine Nuclear Research Institute (PNRI) Philippines
10	**Mr. Tosaporn PASSADU**	Thailand	Ministry of Science and Technology (MOST) Thailand Institute of Nuclear Technology (TINT) Thailand
11	**Mr. Vithit PUNGKUN**	Thailand	Ministry of Science and Technology (MOST) Office of Atoms for Peace (OAP) Thailand

12	**Mr. Safeed AL NEYADI**	United Arab Emirates	Critical National Infrastructure Authority United Arab Emirates
13	**Mr. Farhan AL MARRI**	United Arab Emirates	Critical National Infrastructure Authority United Arab Emirates
14	**Mr. Wael ALHASHMI**	United Arab Emirates	Critical National Infrastructure Authority United Arab Emirates
15	**Mr. Jounghoon Lee**	Korea	Korea Institute of Nuclear Nonproliferation and Control Korea 305-348
1	Mr Thomas Catuogno	USA	Embassy of the United States of America, New Delhi
2	Ms Clarissa Adamson	USA	Embassy of the United States of America, New Delhi

List of Indian Participants

Sr. No.	Name	Designation	Affiliating Organization
1	Shri A. K. Saxena	Add. Chief Engineer	Nuclear Power Corporation of India Limited, Mumbai – 400094
2	Shri Uma Prasad	Add. Chief Engineer(C&ID)	NNuclear Power Corporation of India Limited, Mumbai – 400094
3	Shri C. S. Varghese	SO(H)	Atomic Energy Regulatory Board, Mumbai – 400094
4	Shri S. Narasimhan	PE(IT)	Nabhikiya Vidyut Nigam Ltd.(BHAVINI), Kalpakkam,
5	Shri Rakesh Ranjan	Scientific Officer (F)	Bhabha Atomic Research Centre, Trombay, Mumbai – 400085
6	Shri S. R. Gaidhani	Scientific Officer (F)	Heavy Water Plant, Kota, Rajasthan

7	Shri M. B. Yadav	Scientific Officer (G)	Bhabha Atomic Research Centre, Trombay, Mumbai- 400085
8	Shri N. D. Manohar	Scientific Officer (F)	Bhabha Atomic Research Centre, Trombay, Mumbai – 400085

Annexure – D

Time Table

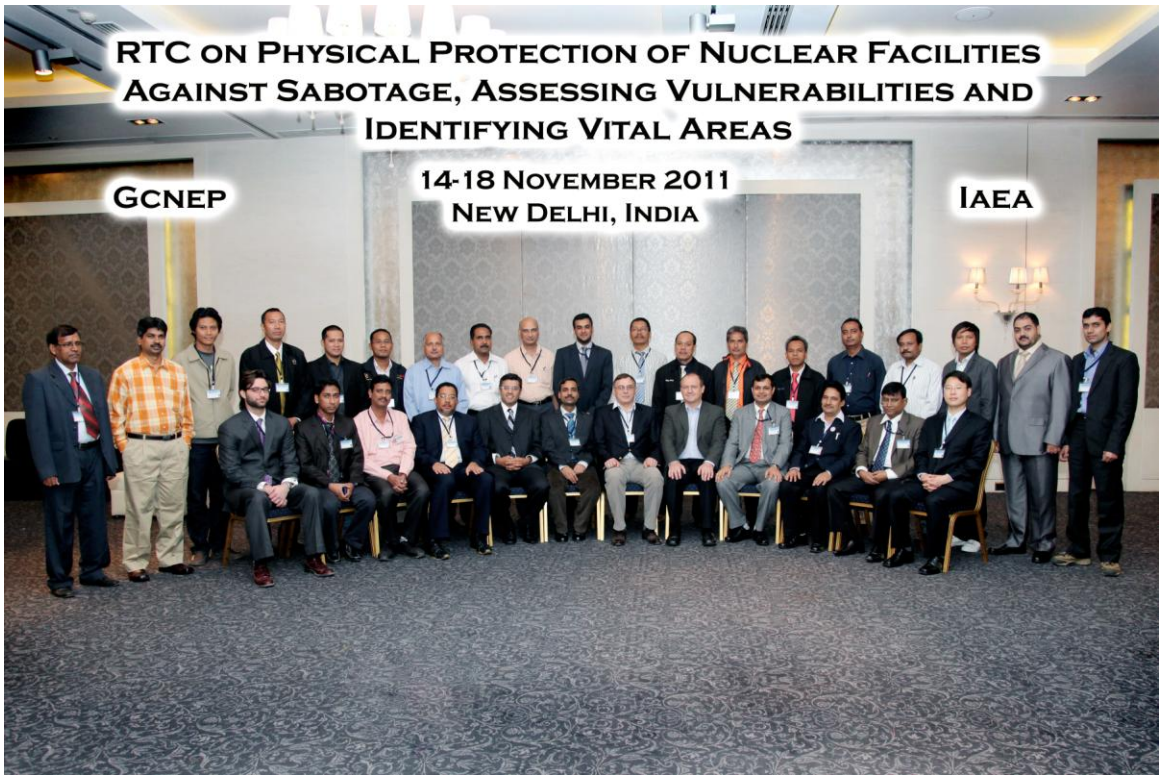
Date	Time	Module number	Module title	Lecturer
Monday, 14 November	9:00- 9:30		Registration of participants	
	9:30- 10:30		Inauguration session	IAEA, India
	10.30- 11.00		Coffee break	
	11.00- 11.15		Introduction of the participants	
	11:15- 11:30	0.1	Course introduction	Ranajit Kumar, India
	11:30 – 12:15	0.2	IAEA Guidance on physical protection of nuclear facilities against sabotage	V Kryuchenkov, IAEA
	12.15 – 13.00	1.1	Need for physical protection at nuclear facilities	Jindrich Malach, Czech Rep.
	13:00- 14:00		Lunch break	
	14:00- 14:45	1.2	Round table discussion on sabotage targets and consequences	All
	14:45- 15:30	2.1	Overview of physical protection concepts	Ranajit Kumar, India
	15:30- 16:00		Coffee break	
	16:00- 17:15		National experience in physical protection	1. Fedric Lall, India 2. J. Malach, Czech Republic
Tuesday, 15 November	9:00- 9:15		Overview of Monday sessions	V Kryuchenkov, IAEA
	9:15- 10:00	2.2	Round table discussion on Physical Protection Concepts	
	10:00- 10:45	3.1	Overview of safety concepts important for sabotage consideration	Dr. Sanyasi .Rao, India

	10:45- 11:15		Coffee break	
	11:15- 12:00	4.1	Identification of areas that must be protected against sabotage (1)	Riyaz Natha, USA
	12:00-12:15		Coffee break	
	12:15- 13:00	4.1	Identification of areas that must be protected against sabotage (2)	V Kryuchenkov, IAEA
	13:00- 14:00		Lunch break	
	14:00- 15:30	4.2	Exercise on process of identification of areas to be protected against sabotage	Two sub-groups
	15:30- 16:00		Coffee break	
	16:00- 16:45	5.1	Process of design a physical protection system (PPS) against sabotage	J. Malach, Czec Rep.
Wednesday, 16 November	06.30- 20:00		Facility tour to Narora Atomic Power Station	
Thursday, 17 November	9:00- 9:15		Overview of Tuesday and Wednesday activities	Ranajit Kumar, India
	9:15- 10:00	6.1	PPS Measures for Protection against Sabotage	Anand Laddha, India
	10:00- 10:30		Coffee break	
	10:30- 11:15	7.1	Assessment of PPS vulnerabilities (1)	Ranajit Kumar, India
	11:15- 11:30		Coffee break	
	11:30- 12:00		Assessment of PPS vulnerabilities (2)	Riyaz Natha, USA
	12:00- 13:00	7.2	Exercise PPS vulnerability assessment	
	13:00- 14:00		Lunch break	

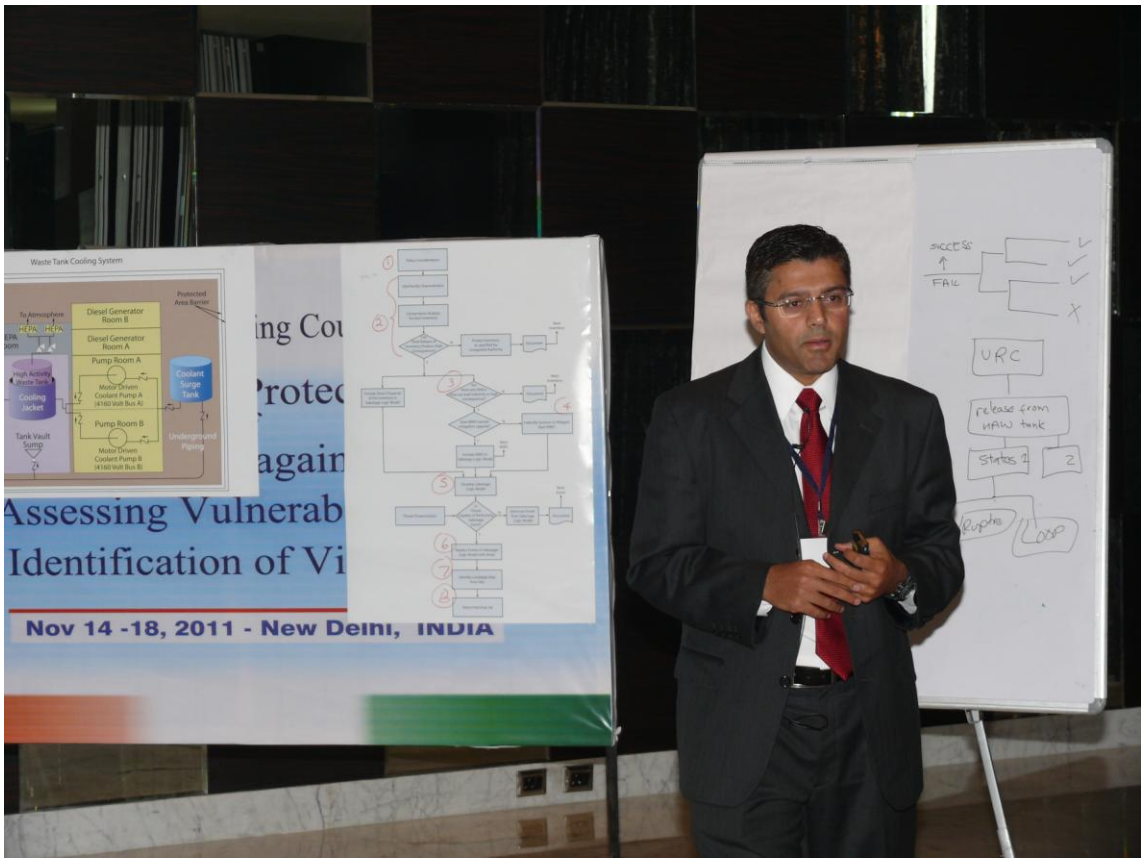
	14:00- 15:00	8.1	Measures to mitigate or minimize radiological consequences of sabotage	V.Kryuchenkov, IAEA
	15:00- 15:30		Coffee break	
	15:30- 16:30	8.2	Exercise on measures to mitigate or minimize consequences of sabotage	Two sub-groups
	16.30 – 17.15		National experience in physical protection – India	H.C.Mehta, India
Friday, 18 November	9:00- 9:15		Overview of Thursday sessions	Riyaz Natha,USA
	9:15- 10:00	9.1	Resources required for PPS design and evaluation process for protection of nuclear facilities against sabotage	Ranjana Kulgod, India
	10:00- 10:45	9.2	Exercise on resources required for design of PPS against sabotage	Two sub-groups
	10:45- 11:15		Coffee break	
	11:15-11:45		Feedback from the participants	India, IAEA
	11:45- 12:45		Distribution of certificates and closure of the course	India, IAEA

- **Group 1 -** Mr. Vladimir Kryuchenkov and Mr. Ranajit Kumar
  Group 2 - Mr.Jindrich Malach and Mr. Riyaz Natha

Annexure – E
Course Photos




GCNEP
Regional Training Course on
IAEA
Physical Protection
of
Nuclear Facilities against Sabotage,
Assessing Vulnerabilities and
Identification of Vital Areas
Nov 14 -18, 2011 - New Delhi, INDIA


Waste Tank Cooling System
Diesel Generator Room B
Diesel Generator Room A
Pump Room A
Pump Room B
Coolant Surge Tank
Cooling Jacket
Tank Vault Sump
Underground Piping
Assessing Vulnerab
Identification of Vi
Nov 14 -18, 2011 - New Delhi, INDIA
URC
release from HAW tank
Status 2
2
Loop


GCNEP
Regional Training Course on
IAEA
Physical Protection
of
Nuclear Facilities against Sabotag
Assessing Vulnerabilities and
Identification of Vital Areas
Nov 14 -18, 2011 - New Delhi, INDIA