A REVIEW PAPER ON NUCLEAR'S POWER PLANTS SAFETY

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***Abstract*- This summary is about security, awareness on Nuclear power plant. Security is important topic in India and it is necessary to dissipate right information to all the public at large .in this I already briefly described how the security in NPP's is maintained. NPPs industry improved the security and performance of reactors designs. However, a perfect security cannot be guaranteed. Potential sources of problems include human error and external events that have greater impact than anticipated. At first, we will safely focuses on main radiological releases from power plant activities and secondly, we will have to avoid misuse of radioactive material with non-state elements.**

I. INTRODUCTION

Nuclear power plants are the fourth largest source of electricity in India. As come for security in Nuclear power plants often less understood and more talked.
Currently, all the NPPs in India are under the Nuclear Power Corporation of India limited (NPCIL). The NPPs in India are not only safe but are also well regulated, have proper well documented and periodically rehearsed emergency preparedness, also have medical examination, dosimetry and bioassay and are backed-up by fully equipped personnel. Decontamination centers manned by doctor qualified in occupational and industrial health and also have specific training in handling radiological emergencies. Security is accorded overriding priority in all the activities. All nuclear facilities are designed sited constructed, commissioned and operated in accordance with strict quality and security. The regulatory framework in the country is robust with Atomic Energy Regulatory Board having the power to frame the policy, laying down security standard and requirement and monitoring and enforcing all the security provision . The AERB exercise the regulator control through a stage-wise system of licensing in over 278 reactor years
of operation of power operation

II. EVALUATION PROCEDURE

For evaluating security measures inside Sudanese thermal power plants, the following tools were used for evaluation:

a- Detailed questionnaires campaign.
b- Field security inspection of power plants.
c- Sound level measurement.
d- Meetings with personnel concerned in security and key employees in power plant

III. RADIOLOGICAL PROTECTION OF WORKERS.

The following measure ensures the radiological protection of the public due the operation of NPPs.

Dose Limit
At nuclear sites AERB prescribed the limits to a member of public at exclusion distance due to release of radioactive effluents from nuclear facilities.

1 MSV (whole body)/ Year.

1) Effective dose
   a) Twenty Milli-Sievert /year averaged over five consecutive years.
   b) A maximum of 30 mSv in any year.
2) Equivalent dose (Individual organs)
   a) Eyes lens 152 mSv/year.
   b) Skin 500 mSv/year.
   c) Extremities 500 mSv/year.
3) Pregnant woman

a) Equivalent dose limit to the surface of the woman's lower abdomen -2 mSv.
b) Annual Limit on Intake for radionuclides -0.05 ALI.

4) Apprentices and students.
   a) Effective dose (whole body): 6 mSv/year.
   b) Equivalent dose (individual organs); Eye lens 15 mSv/year.
   Skin 50 mSv/year.
   Extremities 50 mSv/year

IV. RADIOACTIVE WASTE CONTROL

The performance of the radioactive waste control system established at NPPs is reviewed to ensure that appropriate methods and control practice continue to be in place and the generation of radioactive waste is kept to as minimum as practicable in minimum as practicable in terms of activity and volume.

1) Method of Disposal and monitoring.

Gaseous waste from reactor building are filtered using prefilters and highefficiency particulate air filters and released after monitoring through a stack of 100m height. The release of different radionuclides are monitored and accounted for to demonstrate that the releases are within the prescribed limits. 2) Authorised limits of discharge The discharge's of radioactive waste from NPPs is governed by the atomic Energy rules 1987. The authorized limits are sets as much lower value than derived limits to achieve effluent release ALARA. The release from NPPs have been only fraction of release limits specified

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Noise and Sound Level Measurement

To evaluate effect of noise on employees in power plants, it was necessary to measure noise intensity or average sound level in the power plant, and the time that employees spend beside the source of the sound, termed as, Time Weight Average (TWA). Sound measurement focused at the source of the sound, not the ambient noise in power plants For this purpose and for the sake of obtaining accurate readings, a Digital Sound Level Meter was used for measurement.

The procedure for measuring sound levels was

based on the following points:-

1. Selection of the sources of noise.
2. Mechanical condition of the source of noise under test.
3. Specifying the normal distance of employees from the source of noise while they are normally performing their jobs.
4. Effect of noise transmitted to neighboring employees at other sections of the power plant

(1) Equipment for handling design basis accidents

Equipment for handling design basis accidents can be strengthened according to these concrete recommendations based on an evaluation of the effects of internal fires, internal overflows, external events (volcanos, tornados, external fires), etc. There are two major ways in which equipment can be strengthened for handling design basis accidents**(a) As a countermeasure against internal fires** Implement equipment countermeasures against internal fires to maintain security.

i.Use fire-resistant and incombustible materials

1) Install fire sensing systems
2)Install fire extinguishers
3)Protect sections with fireproofing walls

(b) As a countermeasure against internal overflows Implement equipment countermeasures against internal overflows to maintain security.

a) Install watertight doors

1)Install dams
2)Install leak detector

Engineering

Several issues arise in prolonging the lives of nuclear plants which were originally designed for normal 30-40 years operating lives. System, structure s and components whose characteristic change gradually with time are subject of attention, which is applied with vastly greater scientific technical knowledge then that of available to the original designer many decades ago.

A second issue is that of obsolescence for instance, older reactor have's analogue instrument and control system and a question

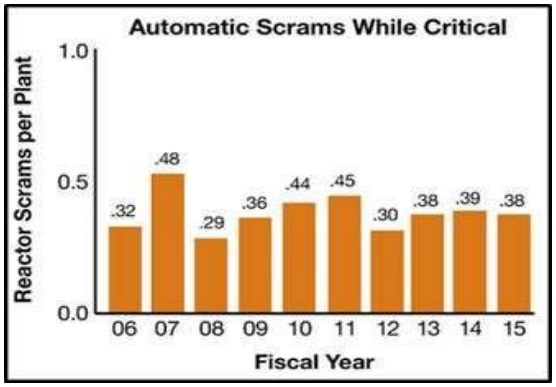
must be faced regarding whether there are replaced with digital in a major mid-life overhaul, or simply maintained.

Thirdly, the properties of material may degrade with age, particularly with heat and neutron irradiation. In some early Russian pressurized water reactor, the pressure vessel is relatively narrow and thus subject to greater neutron bombardment that a wider one. The raise question of embitterment and has had to be checked carefully before extending
licences

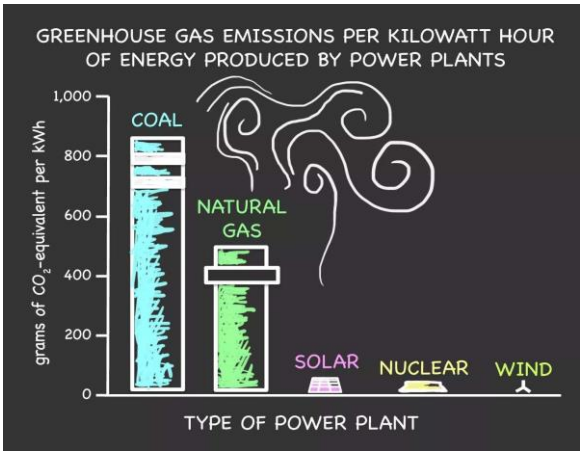
Knowledge control

The IAEA has a security knowledge base for ageing and long term operation of nuclear power plant which aims to develop a framework for sharing information on ageing control and long term operation of nuclear power plant. Nuclear DKM addresses the specific needs of nuclear plants and organization. Its scope extends from research and development, through design and engineering, construction, commissioning, operations, maintenance, refurbishment and long term operation.

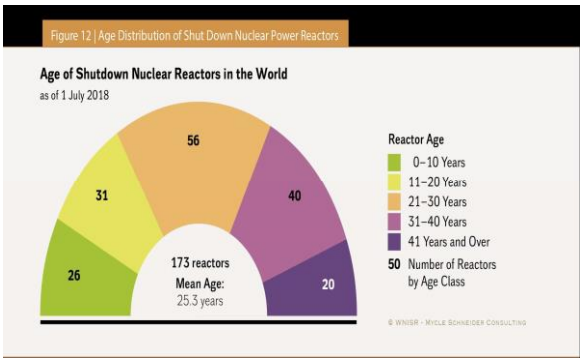
Graphical Representation



Environmental control of NPP's



Ageing representation of NPP's



V. RESULT

The evidence over six decades shows that nuclear power is a safe means of generating electricity. The risk of accidents in nuclear power plants is low and declining. The consequences of an accident or terrorist attack are minimal compared with other commonly accepted risks.

The routine health risks and greenhouse gas emissions from nuclear fission power are small relative to those associated with coal, but there are several "catastrophic risks"

"Accumulated evidence about radiation health effects on atomic bomb survivors and other radiation-exposed people has formed the basis for national and international regulations about radiation protection. However, past experiences suggest that common issues were not necessarily physical health problems directly attributable to radiation exposure, but rather psychological and social effects. Additionally,

evacuation and long-term displacement created severe health-care problems for the most vulnerable people, such as hospital inpatients and elderly people.[

VI. CONCLUSION

With an increasing appetite for the consumption of electricity in India. It is very important to implements NPPs for the generation of electricity and for this we will have to manage strong security upon NPPs. Various factor like design, dose, aspect, control, and ageing and knowledge control are kept in mind when it comes for security control.

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