Technical Meeting on Outage Management Optimization Strategy in NPP, development Lessons Learned and Good Practices

6-9.10.2015

Scientific Secretary H. Varjonen
Safety Pre-Job Briefing

- Emergency Reporting: #99
- VIC Medical Service Emergency: #22222
- Duty Security Office: #3903
- Meeting Admin contact: #22801 (Ana Bakholdina-Schnitzer)
- Evacuation
  - Exits
  - Extinguishers
  - Fire wardens
- Walkways—stay on cleared path / do not hop barriers.

Upon hearing an alarm:
- Stop working & shut off electric equipment
- Clear aisles of obstructions
- Follow advice of Scientific Secretary and evacuate area via nearest emergency exit (follow wardens with yellow or orange vests)
- Public assembly areas both within and outside the VIC premises will be made known as situation requires (typically Donau Park).
IAEA at a Glance

• Founded in 1957
• 165 member states
• 2560 staff
• Headquarters in Vienna
• Nobel Peace Prize - 2005

• Budget in 2015
  – Regular Budget ~ € 345 Million
  – Technical Cooperation Programme ~ € 100 Million
  – Extra-budgetary Contributions ~ € 55 Million
The IAEA and its Mission

IAEA is the UN’s scientific forum for cooperation in the nuclear field.

Maximizing the contribution of nuclear technology to the world, while verifying its peaceful use
The Three pillars

RELATIONSHIP BETWEEN MANDATE (GOALS, PILLARS)
STRUCTURE OF THE SECRETARIAT, PROGRAMME AND BUDGET

The Three Pillars

Technology  Safety  Verification

Nuclear Science and Technology  Nuclear Energy  Technical Cooperation  Nuclear Safety and Security  Policy and Management  Nuclear Verification
438 reactors in operation (379 GWₑ)
2 reactors in long-term shutdown
67 reactors under construction

As of September 2015
Age of operating reactors, totally 438 reactors in operation

(As of June 2015)
Background: International Cooperation

• The IAEA is required by its Statute to promote international cooperation

  • Article II: The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world.

  • Article III.A.6: To establish or adopt standards of safety for protection of health and minimization of danger to life and property

  • Article VIII (Exchange of Information): Each member should make available such information as would, in the judgement of the member, be helpful to the Agency. [...] The Agency shall assemble and make available in an accessible form the information made available to it [...] It shall take positive steps to encourage the exchange among its members of information relating to the nature and peaceful uses of atomic energy and shall serve as an intermediary among its members for this purpose.
Facilitation of International Cooperation

- International Safety Related Conventions
- Codes of Conduct
- Safety Standards
- Technical Cooperation Programmes
  - National, Regional, Interregional
  - Special Projects (ex. IGSCC, PLiM, PUR)
- Technical Documents (ex. TECDOC), Reports/Guidelines (ex. NES, INSAG), Proceedings, Books, and other publications
- Operational Safety Reviews (PROSPER, SCART, SALTO)
- Safety and Performance Databases (IRS, FINAS, etc.)
IAEA Activity Cycle to Improve Safety & Performance

Technological Documents, Guidelines, Reports (TECDOC, NES, SRS, etc.)

Safety Standards

OPERATORS
REGULATORS

DESIGNERS
NEWCOMERS

• Operational Experience and Generic Issues Databases
• Coordinated Research Projects
• Workshops/Conferences/Symposiums
• Expert and Consultant Teams/Industry Working Groups
• Engineering, Operational, and Regulatory Reviews
• National, Regional, International Technical Cooperation Projects
• Agency Advisory Committees
• Specialty Groups

Review

Review (i.e. OSART)
IAEA Integrated Support

Direct Service & Assistance (Technical Cooperation Projects)

• Training courses
• Workshops
• Expert Missions
• Equipment procurement
• Engineering, Operational, and Regulatory Reviews

Development of series of technical guidelines & reports

• Consultancy Meetings
• Technical Meetings
• Technical Working Groups
• Coordinated Research
Safety Standards - Overview

- **Safety Fundamentals**: Present objectives, concepts, principles of protection and safety. Basis for Safety Requirements.
- **Safety Requirements**: Establish the requirements that must be met to ensure the protection of people and the environment. Governed by the Safety Fundamentals.
- **Safety Guides**: Provide recommendations and guidance on how to comply with the Safety Requirements.
Technical/Programmatic Guidelines - Overview

Publications that complement the Safety Guidelines for a particular area, issue, research topic, operational experience, etc.:

- Technical Documents (TECDOC),
- Reports (NES, SRS, TRS, INSAG),
- Proceedings,
- Books,
- Peer review results, summaries, highlights
- Electronic databases
Outage Optimization Activities (2014-2016)

• The first Consultancy meeting
  ➢ December 2014 in Vienna
  ➢ To draft the TECDOC-1315 with the input from international experts

• The second Consultancy Meeting
  ➢ Planned for 2Q in 2015
  ➢ To develop to extended draft

• Technical meeting
  ➢ 6-9.10.2015 in Vienna
  ➢ To finalize the draft material for publication
Why updating existing document?

- Existing document published 2002 -> time to review the document up to date
- Possible changes in safety culture
- Possible changes and improvements in management policy -> outage management
- Improvements in execution methods
- Optimization of maintenance and inspection programs
- e.g
Potentials of outage optimization

- Reducing outage time, cost savings and better load factor
- Reducing maintenance costs, by synchronizing maintenance activities
- Avoid production losses
- Better synchronizing plant modifications to outages
- Spare part management and availability
Outage optimization strategy

- Care preparing, planning and coal settings
- Actions for improvements
- Improvements
- Execution
- Reporting, feedback and lessons learnt (post outage)
Main areas for improvements?

- Outage management
  - Improvements in organisation
  - Improvements in outage scheduling
  - General outage preparing
- Long-, medium-, and short term planning
- Plant technical process optimization
- Execution and tool improvements
- Spare part management -> synchronizing with long term planning
- IT-tools
Potential problems

- To get enough skilled labor force (own / contractors)
- Ensure holistic approach to planning
- The possibilities to outage extension
- Missing spare parts
- Results of inspections can increase the workload
Conclusion

• Outages can only be successful when the outage work is planned effectively before the work is started
...Thank you for your attention