



Pre-requisites to the preparation of decommissioning plan


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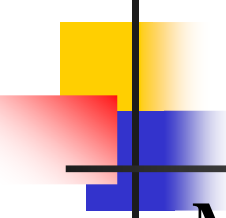
Pre-requisites

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- **End State** of the decommissioning activities- accordingly with DP- to be carefully analyzed in Reactor organization, Board of the Directors, Scientific Council, Administration Board;
 - **Decommissioning strategies:** immediate dismantling, deferred dismantling, entombment: option analyses, select option, justify, demonstrate: safely radioactive waste management, nuclear fuel (fresh and spent) management, organizational, technical, human and financial resources availability, radiological characterization of SSEC, (plan and survey)
 - DP - Have been elaborated from operation period and periodically up-dated, review by Regulatory Body, recording the modifications in DP- rev 1, 2, etc...

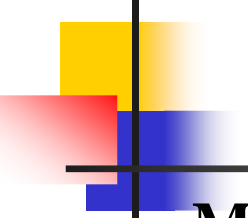
Pre-requisites

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- **Physical boundaries (scope) of decommissioning project:**
follow in general the initial license for siting, but adapt to specific situation up-dated during reactor was in operation: ex; Treatment Plant for Radioactive Waste, AFR storage ponds for SNF, new facilities for radioisotopes & radiopharmaceuticals production, for R&D&I in nuclear and atomic structure, detectors,- very important in elaboration EIA, release at the end of decommissioning project the land, soil, subsoil, underground water, estimates the cost for environmental rehabilitation, establish responsibility area of decommissioning organisation;

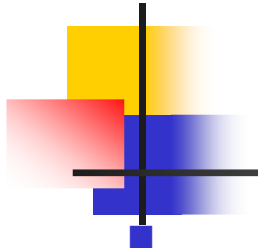
Pre-requisites

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- **Material management route (capabilities for treatment, storage, disposal)**
 - procedures for free release of materials from regulatory control (clearance)- technical, human resources trained, temporary storage spaces, select by the category of material,
 - Material route:
 - Clearance material (recycling, reuse, redevelopment),
 - Radioactive waste- low and medium level, SL, for treatment, conditioning, disposal (based of the WAC for National repository for radioactive waste)
 - Radioactive waste LL, not comply WAC for disposal- storage on Treatment Plant for Radioactive Waste- special spaces

Pre-requisites

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- **Material management route (capabilities for treatment, storage, disposal)**
 - **Capabilities for radioactive waste management:**
 - Authorized facilities near the research reactor for collecting, transport, treating, conditioning, storage, disposal: for solid waste by cementation, liquid waste by filtering, including inverse osmosis, after modernization-will be in function-compactor, reducing volume a plastic by thermal method follow-up cementation,
 - Procedures in place with equipment for radiological characterisation

Pre-requisites



Project management scheme (subcontracted activities)

- IFIN-HH was operating organization;
- IFIN-HH is decommissioning organisation based on DP and Integrate Management Manual: safety and security, quality, health and safety of worker, environmental protection-approved by CNCAN, new organizational chart, new jobs,
- IFIN-HH will contracted some activities concerned with: authorization and maintenance of lifting equipment and operator, metrology of instrumentation, building and installation-utilities rehabilitation, independent organization authorized by CNCAN for radiological survey verification- there are legal framework for external contractors in nuclear activities

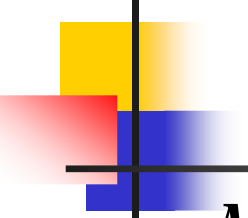
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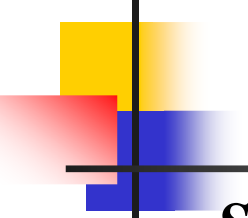
Phasing (by type of activity)

- Phase no stage, for prevent confusion (IAEA decommissioning strategy stage 1,2,3)
- Phase 1,2,3 for easy comparative action of IAEA SRS 45 with Romanian CNCAN regulation NSN 15 concern to decommissioning RR, Treatment Plat for Radioactive Waste, Intermediate (Storage) Facility, Sub-critical Assemblies;
- Obtain first of all approval of CNCAN for using SRS 45 as methodology for elaboration DP, demonstrate that contain same aspects (requirements)

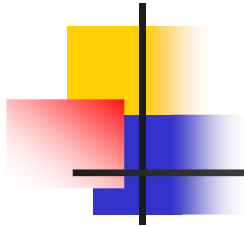
Pre-requisites

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- *Management of spent/fresh fuel from operation period*
 - *AFR wet ponds for SNF assemblies-from 1982;*
 - *No SNF assemblies in reactor installations*
 - *HEU SNF type C-36, return back in Russian Federation, including HLW resulted from reprocessing will be disposed in RF- June 2009*
 - *Fresh fuel returned back in RF since 2003;*
 - *LEU SNF assemblies will be returned back in RF in 2012.*

Pre-requisites

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- *Selection of decommissioning technologies*
 - Decontamination, dismantling and demolition;
 - Decontamination (metallic material) after cost benefits analyses, justification, secondary waste, possibility for clearance, execution in Radioactive Waste Treatment Plant.
Decontamination of the concrete: by scarification, by blasting
 - Dismantling by cutting (mechanical methods) -no thermal methods)- special tents in Reactor Hall
 - Demolition- mechanical-Brokk, diamond wire installation

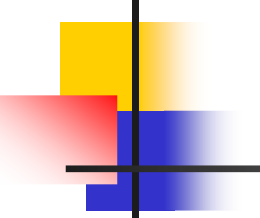
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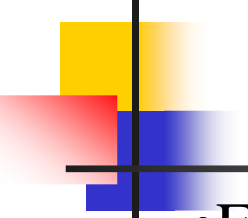
Funding

- - Decommissioning funding by state budget by Governmental Decision (multi years funding)
 - Pre-decommissioning activities very important for preparatory actions
 - Participation in national and international project for funding in pre-decom activities: IAEA, PHARE, DoE-ANL, DoE- NNSA,

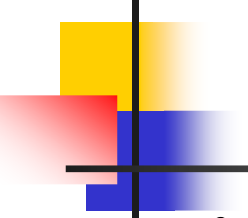
Pre-requisites

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- • Transition/pre-decommissioning activities
 - December 1997- 1 January 2010
 - Very important period for elaboration documentation, procedures, clean-up, make a team for decommissioning,
 - Attract funds for solving critical issues: SNF assemblies, graphite and aluminum activated materials,
 - Elaboration FS, EIS, Environmental Agreement, DP, QM for transition phase and for preparatory of decommissioning activities; Action Plan approved by Minister in May 2003- immediate dismantling strategy
 - Training the HR in important nuclear centers (Karlsruhe, Risso, etc)
 - Participation in IAEA international projects R2D2P, DeSa, IDN,

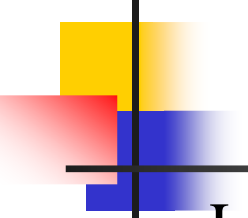
Critical developments

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- Fresh / spent fuel management (repatriation to Russian Federation), no in INR Pitesti, no in NPP site Cernavoda, no storage for HLW after reprocessing
 - Abandonment of deferred dismantling (originally 30-40 years) -
- great development in S-E area, after development N area of Bucharest,(industrial, residential), increase taxes and tariffs from CNCAN, increase VAT, danger to left experienced peoples, important development in IFIN-HH in European R&D&I infrastructure, justification as loan from state budget for new centre in material sciences (micro production, new materials, composites, eco-materials, radiation technology and processing)
 - Building management (ventilation, utilities, authorizations from people, surveillance, maintenance,

Critical developments

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- • Refurbishment of waste processing and disposal facilities
 - - Treatment Plant and National Repository for Radioactive Waste only for institutional radioactive waste
 - Must be refurbishment (2011-2012) completion for solving radioactive waste stream resulted from VVR-S decommissioning activities
 - Great advantage for decommissioning RR : liquid radioactive waste sent direct to Treatment Plant by pipes, internal route – way to Treatment Plant-no public route, no interference with daily activities from IFIN-HH

Critical developments

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- Loss of experience:
 - The young people not want to work in nuclear field;
 - Retirement the personnel;
 - Low investment in HR in nuclear field: practical works, engineers, need to invest many years (5-20 y) for specialized workers in nuclear;
 - Many influence from economical crises, nuclear accidents;