



Post-Fukushima R&D: The SNETP Perspective

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CONTENTS

- ***Framework: The SNETP***
- ***The Approach to Safety R&D***
- ***The SNETP Statement***
- ***The SRA Safety Chapter***
- ***The NUGENIA's view***
- ***Final Remarks***



The SNETP

(Sustainable Nuclear Energy Technology Platform)

- *A European Technology Platform established in 2007.*
- *Endorsed by the European Commission (independent, though).*
- *More than 100 stakeholders (industry, research, safety orgs., universities, N-G org.).*



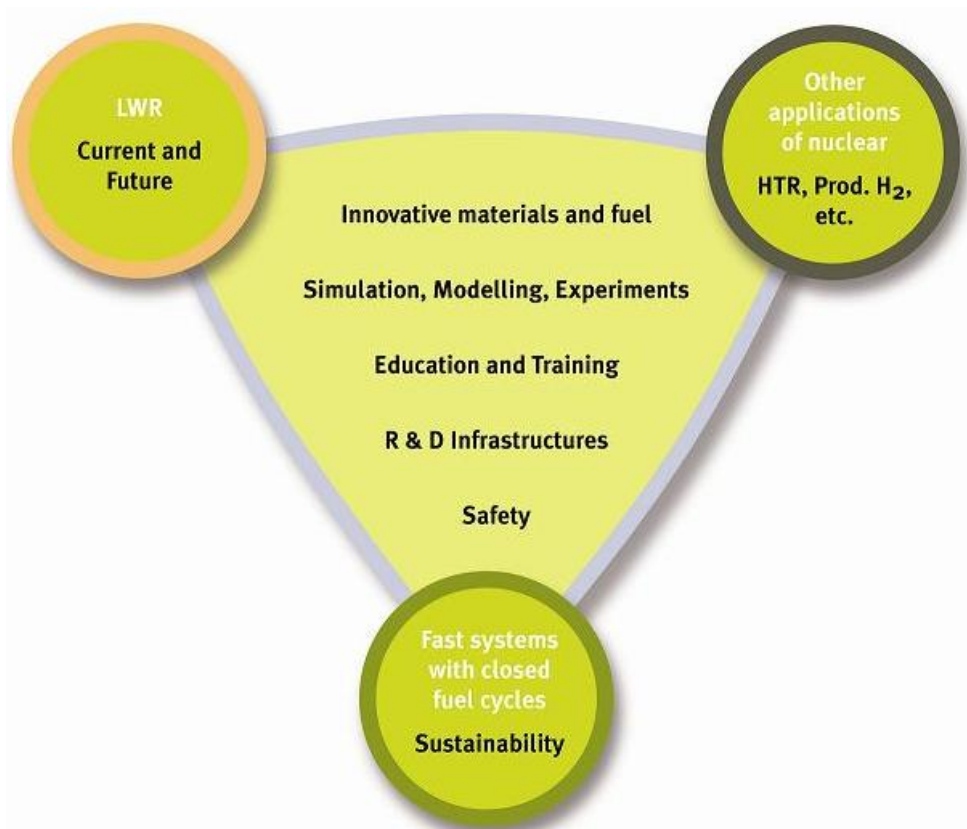
RESEARCH, DEVELOPMENT and DEMONSTRATION
of nuclear fission technologies.



Europe's Strategic Energy Technology SET-Plan

The **SNETP** (Sustainable Nuclear Energy Technology Platform)

NUGENIA

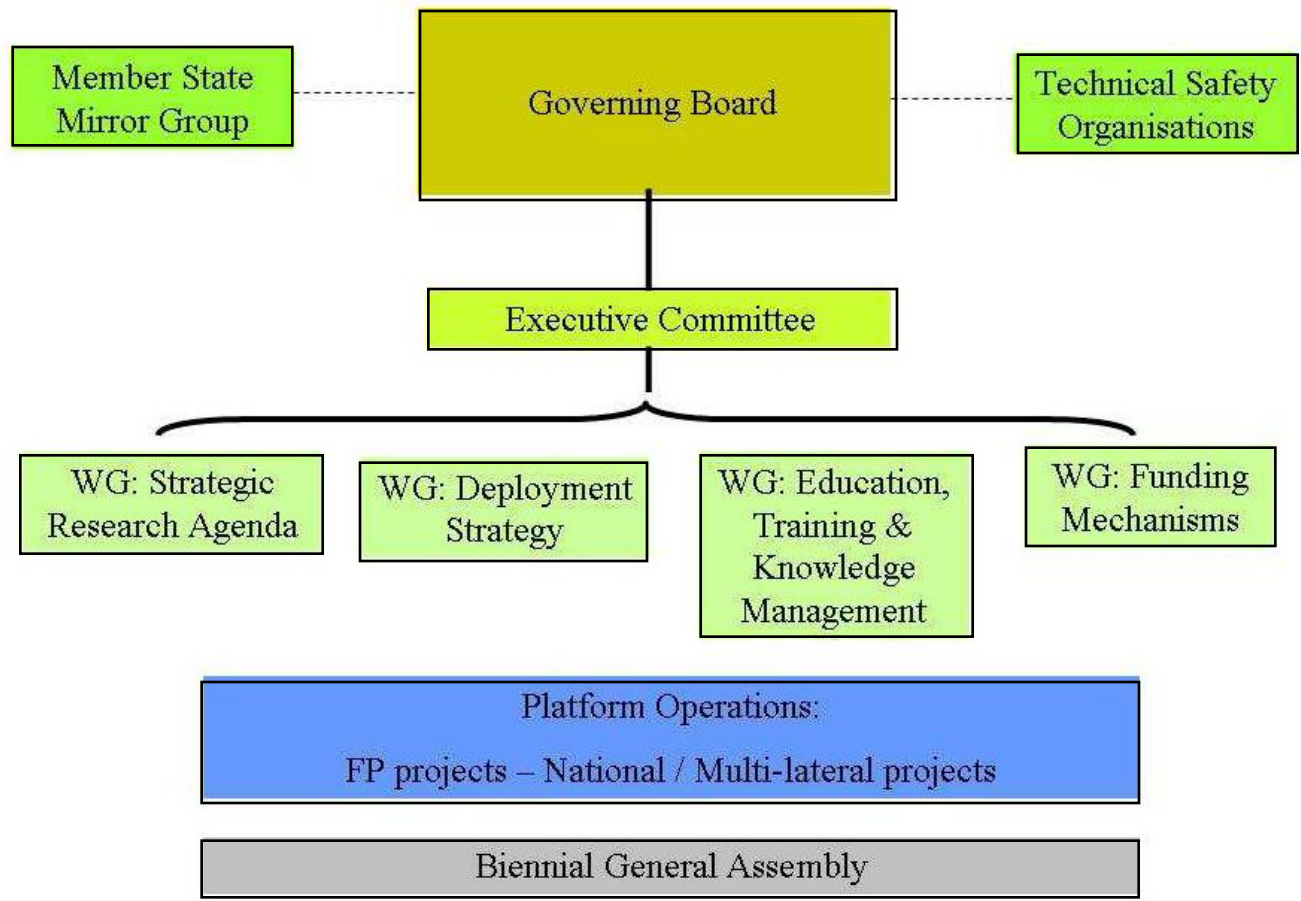


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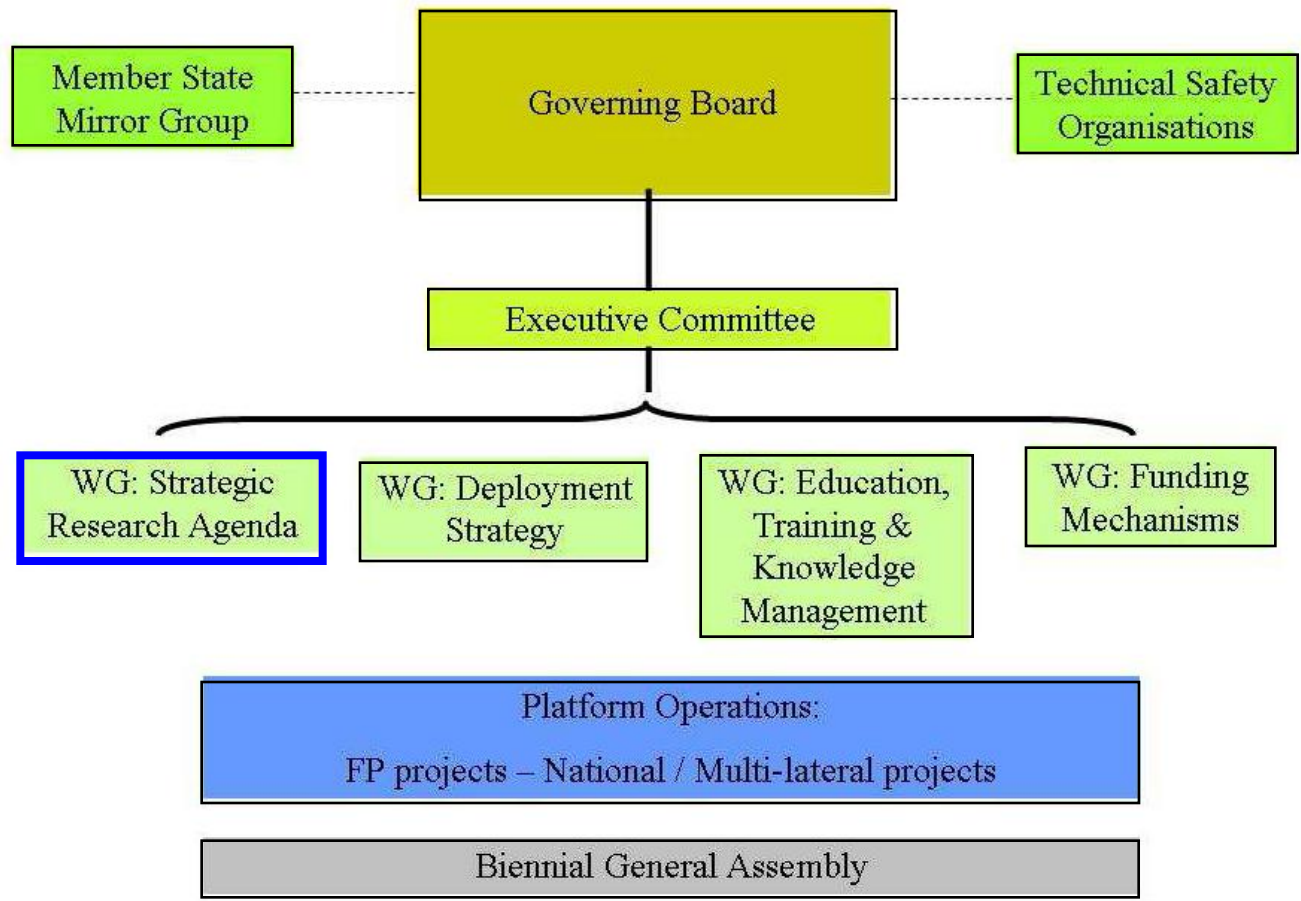
The SNETP

(Sustainable Nuclear Energy Technology Platform)



The **SNETP**

(Sustainable Nuclear Energy Technology Platform)





Approach to Safety R&D

Regulators

Operators



Basic R&D

Applied R&D

EURATOM ——— Natl. Progs

OECD-NEA ——— Regulators

Intl. Consortia ——— Operators

Regulators ——— Operators



The SNETP Statement

(March 31st, 2011)

“SNETP supports the common EU-level approach ... to reassess the safety margins of NPPs across Europe”.

SNETP recommended “to refrain from making any premature policy decisions” UNTIL “the current situation has been brought fully under control and the root causes of the events have been understood”

“SNETP gives nuclear safety the highest priority in its vision and research agenda”

*“ The Governing Board has decided to set up **a dedicated task force to assess the lessons learned from the Fukushima accident**”*



The SRA “Safety Chapter”

(Strategic Research Agenda - Safety)

The R&D Drivers:

- *Higher level of Safety objectives G. II & III (WENRA).*
- *Optimum Efficiency and availability (Operators)*
- *Safety harmonization practices (SNETP)*



- ***Evolution of the safety criteria and of the operational practices.***
- ***Best estimate evaluation of the reactor systems.***



The SRA “Safety Chapter”

(Strategic Research Agenda - Safety)

The “Fukushima Footprint”:

Research:

- *Extreme external events.*
- *Common mode failures.*
- *Human behavior – DiD*

Development:

- *Inspection methods and devices ($\uparrow T, RH, D$).*
- *Remote sampling & decont. methods.*
- *Repairing technologies (leakage points).*
- *System to prevent RM dispersal.*
- *Core de-fueling technologies.*
- *Fuel debris removal technologies.*



**Plant Design
&
External Hazards**



Fukushima



**Emergency Mgmt
&
Radiological Impact**



**Analysis & Mgmt
of
Severe Accidents**



The SRA “Safety Chapter”

(Strategic Research Agenda - Safety)

Priority Research Issues (I)

Plant Design & External Hazards

- Vulnerabilities of DiD and safety margins to BDB loads.*
- Improved methods for external event hazard evaluation.*
- Probabilistic methods to assess plant safety in relation to extreme events.*
- Deterministic methods to assess plant safety in relation to extreme events.*
- Human and organizational factors under high stress & harmful conditions.*



The SRA “Safety Chapter” *(Strategic Research Agenda - Safety)*

Priority Research Issues (II)

Analysis & Mgmt of Severe Accidents

- *Advanced safety systems.*
- *Material behavior.*
- *Advanced analysis methods.*
- *Improved modeling of fuel degradation in SFP.*
- *Improved procedures for SAMgmt.*



The SRA “Safety Chapter” *(Strategic Research Agenda - Safety)*

Priority Research Issues (III)

Emergency Mgmt & Radiological Impact

- *Assessment of radiological effects.*
- *Methods for minimization of contamination in NPP surroundings.*
- *Methods for treatment of large volume of radioactive waste.*
- *Accident mgmt as for the integrated rescue system.*



The NUGENIA's View

(NUclear GENeration II & III Association)

- *International non-profit association under Belgian law.*
- *Mandated by the SNETP.*
- *Around 53 members (17 countries; industry, TSO, research, academia).*



RESEARCH & DEVELOPMENT
on Generation II & III nuclear systems.



The NUGENIA's View

(NUclear GENeration II & III Association)

Technical Areas

- 1. Plant safety and risk*
- 2. Severe accidents***
- 3. Core and reactor operation*
- 4. System and component integrity*
- 5. Fuel, waste and decommissioning*
- 6. Innovative Gen III design*
- 7. Harmonisation*
- 8. In-service inspection and NDE*



The NUGENIA's View

(NUclear GENeration II & III Association)

Specific Input to SNETP-SRA from Fukushima

- ...
- *Suppression pools: stratification & scrubbing.*
- *Containment venting.*
- *Source Term mitigation systems.*
- *Gas combustion (distribution; mitigation systems; DDT; ...).*
- *Corium/Debris coolability.*
- *Modeling of SFP severe degradation (HT regimes; fuel degradation; ...).*
- *New instrumentation.*
- ...



Final Remarks

- *Fukushima has already highlighted new drivers for R&D.*
- *Fukushima has strongly affected the “coming” SNETP SRA.*
- *Research foreseen on: **BDBA**; external hazards; accident mgmt.*
- *SNETP structure (NUGENIA) looks optimum to address the issues.*

Research Outcomes



Industrial Practice !!



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La I+D Nuclear tras Fukushima

Thank you for your attention !



Unit of Nuclear Safety Research

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