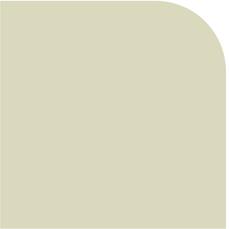


ETSON:

Role and activities
for harmonizing safety
assessment practices

Benoit De Boeck
ETSON President



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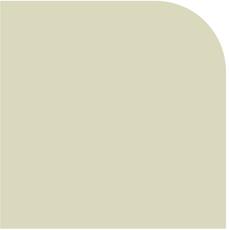
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The rationale for ETSON

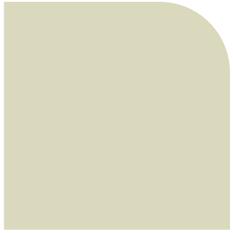
European Technical Safety Organisations have created a statutory organisation to pursue shared goals

European States and the European Union devoted significant resources over the last decades in order to help build up a sustainable **TSO capacity**.

The creation of ETSON in 2006 aimed at developing the contribution of TSOs to :

- **harmonize nuclear safety assessment practices** in Europe,
- define and implement coherent **European research programmes**,
- share and develop **knowledge and expertise** in safety.

ETSON became an Association (under French law, non-profit association) in **February 2011** in order to develop its activities and implement them more effectively.



ETSON core values

Integrity and transparency in our work and relationships
We are committed to the highest standards of integrity and transparency in all our work and relationships.

- Quality and safety are our top priorities
- We are committed to the highest standards of safety and quality in all our work and relationships.
- We are committed to the highest standards of safety and quality in all our work and relationships.

Customer focus and innovation
We are committed to providing our customers with the highest quality products and services, and to continuously innovating to meet their needs.

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Environmental and social responsibility
We are committed to protecting the environment and promoting social responsibility in all our work and relationships.

HWVR Q #p hp ehuv

Germany - GRS
Founding member since 2006
 Independent organisation providing technical and scientific safety expertise to nuclear regulators worldwide. 450 employees.

Finland - VTT
Member since 2008
 Independent institution conducting research on safety, waste management, etc. 2,900 employees including 200 people in nuclear activities.

Lithuania - LEI
Member since 2009
 Expertise and research organisation in engineering, nuclear safety, hydrology, metrology, environmental protection. 300 employees.

Ukraine - SSTC NRS
Associated member since 2010
 State scientific and technical organisation supporting nuclear and radiation safety regulation. 253 employees.

Russia - SEC NRS
Associated member since 2012
 Scientific and technical support organisation on nuclear and radiation safety regulation. 350 employees.

Japan - NRA
Secretariat Associated member since 2014
 Regulatory organisation 1,000 employees.

Belgium - Bel V
Founding member since 2006
 Non-profit nuclear expertise institute for nuclear safety and radiation protection. 80 employees.

United Kingdom - Amec Foster Wheeler
RSD Member since 2015
 Independent organisation providing the full range of scientific and technical regulatory support. Core TSO team of 50 augmented by more than 1,000 technical specialists.

France - IRSN
Founding member since 2006
 Public institute providing research and expertise in nuclear safety and radiation protection (human and environmental). 1,800 employees.

Switzerland - PSI
Member since 2012
 Largest research centre for natural and engineering sciences within Switzerland. Currently 1,800 employees, of which 250 work in the areas of nuclear safety, waste management and radiation protection.

Czech Republic - RC Rez
Member since 2008
 Engineering and scientific research private company dedicated to nuclear technology in various domains and focused on sustainable energy. 900 employees.

Italy - ENEA
Member since 2016
 Public non-profit organization providing research, technology innovation and advanced services in the energy sector. 2700 employers of which around 25% work in areas relevant to nuclear safety, waste management and radiation protection.

Slovenia - JSI
Member since 2013
 Leading Slovenian scientific research institute, covering a broad spectrum of basic and applied research. 930 employees with 60 persons in nuclear activities.

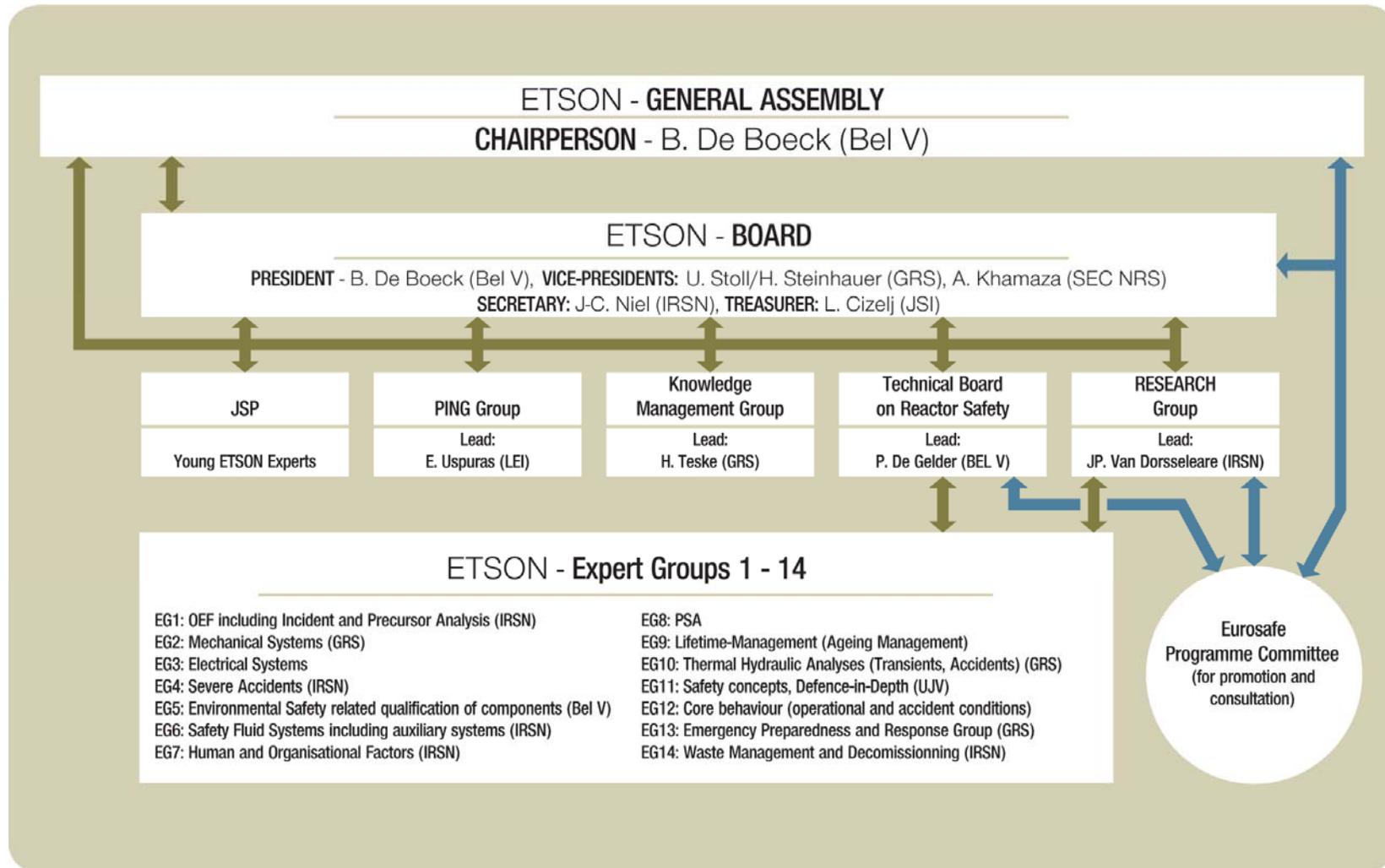
Slovakia - VUJE
Member since 2010
 Research institute on nuclear facilities in Slovakia. 800 employees with 200 people involved in TSO activities.

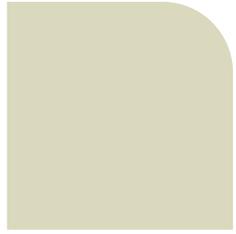
Bulgaria - INRNE
Member since 2013
 Leading Bulgarian Institute for nuclear physics and nuclear energy, radiochemistry, radioactive wastes treatment, monitoring of the environment, nuclear instruments development,... 350 employees.

Hungary - MTA EK
Member since 2015
 Leading Hungarian academic research institute in the field of nuclear safety and security, energy security and materials science. 380 employees with 150 persons in nuclear activities



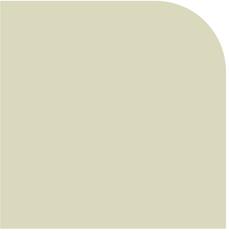
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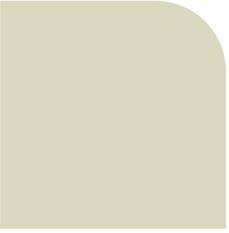
ETSON ACTIVITIES

- **Sharing experience, knowledge, good practices**
- **Research**
- **Joint projects**
- **Training**
- **Outreach and cooperation**



Sharing experience, establishing good practices, disseminating knowledge

- Develop generic methodological guidance for technical safety assessments, in a coherent set of safety assessment guides on key topics
- Develop the European Nuclear Safety Training and Tutoring Institute (ENSTTI),
- Organize technical workshops on relevant issues
- Yearly EUROSAFE technical Conference on Nuclear Safety
- Set up the European “Clearing House” together with the EC



ETSON Expert Groups – Generic ToR

■ ETSON has several technical Expert Groups, to:

- exchange information on analyses and R&D to share experiences and to exchange technical and scientific opinions;
- exchange information on their technical nuclear safety practices and make proposals to harmonise them as far as practicable;
- contribute to the definition of nuclear safety research programmes in defining research needs in their fields of expertise;
- organise cooperation teams for joint projects in order to be prepared to quickly respond to requests from the project management units of the network;
- keep each other informed about new developments in their fields of expertise and within their respective organisation;
- develop, where suitable, a Technical Safety Assessment Guide, describing how to perform safety assessment reviews in their field of activity.

Safety assessment

A general document
(Safety Assessment Guide)
defines the scope of the
methodology used in Europe
during safety assessments,
presents different requirements
for the assessment of nuclear
safety and the technical
elements required to complete
an evaluation.



Safety assessment

The Safety Assessment Guide is supplemented by thematic technical guides:

- Deterministic severe accidents analysis,
- Event review and precursor analysis,
- Human and organisational factors in nuclear facilities design and modification processes,
- Transients and design basis accident analyses,
- Safety Fluid Systems.



ETSON Expert Groups – Other example activities

■ EG on mechanical aspects:

- Working on “Comparison of regulatory requirements for RPV fracture mechanical assessment for PWR plants”

■ EG on PSA:

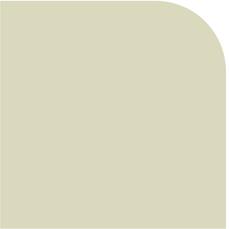
- Working on publication “Lessons learned from PSA by TSOs”

■ Organize technical workshops on relevant issues:

- e.g. the 2015 workshop on earthquake, floods and strategies in case of Loss of Offsite Power, Station Black Out or Loss of Ultimate Heat Sink,
- See publication on ETSON website
- Might result in new EG on “External hazards”

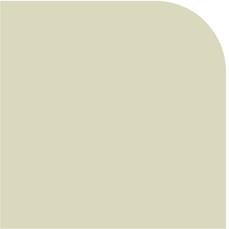
Position Paper on Research needs in nuclear safety

- This document, released in October 2011, prioritized the research needs according to their relevance-to-safety
 - Accounting for preliminary lessons from the Fukushima-Daiichi NPP accident
 - Used for ETSON contribution to the NUGENIA R&D roadmap
- These R&D highest priority needs are still valid and correspond mostly to the objectives of the Article 8 of the 2014 EU Directive
 - Details in the next slide
- Position paper is in the process of being updated



Objectives of Art. 8a and b of the NSD

- Objective to prevent accidents and mitigating its consequences, avoiding:
 - early releases requiring off-site emergency measures but with insufficient time to implement them
 - large radioactive releases requiring protective measures that could not be limited in area or time
- Defence-in-depth to ensure:
 - minimizing the impact of extreme natural and unintended man-made hazards
 - preventing abnormal operation and failures
 - controlling abnormal operation and detecting failures
 - controlling DBA
 - controlling severe conditions, incl. prevention of accident progression and mitigation of SA consequences



Ranking of R&D priorities

- Main objective: to underline a possible convergence of topics for further R&D
- Use the skeleton of the NUGENIA challenges and issues as a basis
- High marks given to e.g.:
 - Severe accident scenarios
 - Spent fuel pool scenarios
 - Impact of external events and of multi-sites effect
 - Advanced safety assessment methodologies
 - Development and validation of integral codes

The ETSON Junior Staff Programme (JSP)

The ETSON Junior Staff Programme (EJSP) brings together young experts from all ETSON members to :

- share knowledge, experience and practices,
- build a network between young experts from different countries,
- develop their ability to work in an international context
- encourage intercultural interaction,
- Improve long-term partnership between member TSOs.

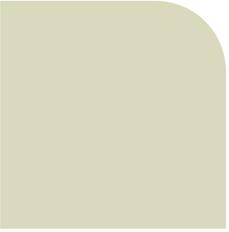


The JSP Workshop is **not a succession of presentations.**

Before the workshop, participants choose **a specific topic** related to their jobs, on which they prepare **a joint work (in groups of 4 participants).**

During the workshop, they present (conventional presentations or practical case studies) **the results of their work.**

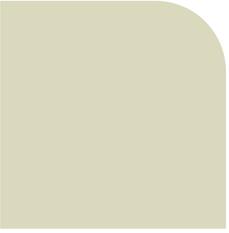
This provides them the opportunity to discuss their specific topics, share and expand their knowledge, make comparative studies between European countries.



The new ETSON Strategy

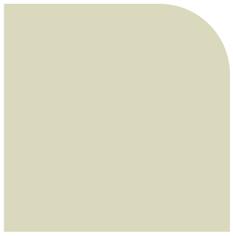
- Vision: enhance and standardize safety practices and science based safety assessments
 - Cooperative workplace for technical safety issues
 - Source of technical reflexions on safety issues
 - Produce technical outcome and positions that foster the enhancement and harmonisation of safety practices

- Strengthen links with other international organisations
 - European Commission: JRC (OEF), DG ENER (NSD)
 - IAEA: TSO Forum, TSO Conference, Safety Standards
 - FORO: MoU signed in 2016



Conclusions

- ETSON fosters collaboration between TSO's since more than 10 years
- Safety assessments are science based and require state of the art expertise
- ETSON benefits from the outcome of R&D
- ETSON identifies the research needs of TSOs
- International collaboration between ETSON and other organisations has been felt to be very useful



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www.etsn.eu

www.eurosafe-forum.org

www.enstti.eu/