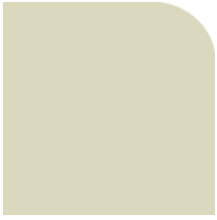


ETSON PROGRESS REPORT

2015



FOREWORD

2015 was again a busy year for the European Technical Safety Organisations Network (ETSON). The aim of ETSON is to promote principles, values and good practice that guarantee the independence of judgment in safety assessments produced by TSO's, and the quality of their services and of their research activities in the field of nuclear safety and security. By so doing, ETSON also contributes to the European harmonisation of nuclear safety practice on the basis of scientific excellence.

A new board was elected in July. I became the new President of ETSON, replacing Jacques Repussard. I really want to thank Jacques whose involvement in setting up the network was instrumental to make ETSON what it is: a strong and active network.

Main activities

Several working groups are active within ETSON. The Technical board on Reactor Safety (TBRS) organized in 2015 a dedicated workshop on earthquake, floods and strategies in case of Loss of Offsite Power, Station Black Out or Loss of Ultimate Heat Sink. This workshop allowed the ETSON members to compare their approaches on these natural hazards and their consequences. The results of the workshop are available on the ETSON website.

A new Technical Safety Assessment Guide (TSAG) dedicated to "Safety Fluid Systems" was published in 2015.

The ETSON Research Group (ERG) continued to analyse the needs of the TSOs in terms of R&D. A paper on R&D priorities was presented at the Eurosafe Forum.

The ETSON Junior Staff Programme (JSP), bringing together young experts from the member organisations, organised its annual summer workshop in Switzerland, hosted by PSI. The subject was material properties in nuclear safety.

The ETSON Award, rewarding a paper written by a group of young scientists from different TSOs, was attributed to a paper from GRS and VTT presented at the Eurosafe Forum.

An expanding network

The membership of ETSON continues to increase. In 2015 AMEC-RSD from the United Kingdom and MTA-EK from Hungary joined the network. At the end of 2015 ETSON counted 15 members and associated members.

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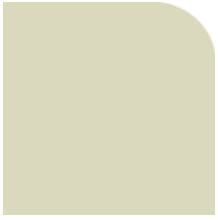
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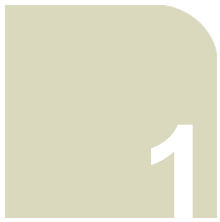
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ORGANISATIONAL MATTERS

1.1 ETSON network extension

During the General Assembly meeting in Hohenkammer, on 9th & 10th of July 2015, AMEC-RSD Foster Wheel, from United Kingdom and represented by M. Peter Moore, joined ETSON. AMEC - RSD is the representative of the British institutes with TSO capacities.

During the second General Assembly 4th of November 2015, MTA-EK, the Hungarian TSO represented by M. Akos Horvath also joined ETSON. MTA-EK has the mandate to speak on behalf of the Hungarian TSO network.

End of 2015, 15 members and associated members belong to ETSON.

Discussions are engaged with other European TSOs to enlarge the network.



Hohenkammer (Germany), 9-10 July 2015

1.2 General Assembly and Board meetings

The year 2015 was an opportunity to further strengthen the overall functioning of the association.

Two General Assemblies coupled with Board meetings were held:

- On the 9th and 10th of July 2015 in Hohenkammer (Germany);

- On the 4th of November 2015, in Brussels (Belgium), on the fringe of the Eurosafe Forum 2015.

- A new Board has been elected in July 2015 with:

M. Benoît De Boeck (Bel V): President
M. Frank-Peter Weiss (GRS): Vice President

M. Alexander Khamaza (SEC NRS): Vice President

M. Jacques Repussard (IRSN): Secretary

M. Leon Cizelj (JSI) : Treasurer

1.3 Accounting and fee payment

The Association has collected the annual fees of 2000 Euros from all ETSON members. The money is dedicated to the external promotion of ETSON and possible limited research actions.



ETSON ACTIVITIES

2.1 ETSON Technical Board on Reactor Safety - Expert Groups

All ETSON members stressed the importance of the ETSON expert groups. The Technical Board on Reactor Safety (TBRS) proposed generic terms of reference. The main role of the TBRS is to manage the different expert groups and to propose to the General Assembly the Technical Safety Assessment Guides for validation before publication. The ETSON organization is presented in Annex 1.

ETSON Expert Groups exist for the following topics:

EX N°	Technical issue
1.	OEF, including Incident and Precursor Analysis
2.	Mechanical Systems
3.	Electrical Systems
4.	Severe Accidents
5.	Environmental qualification
6.	Safety Fluid Systems, including auxiliary systems
7.	Human and Organizational Factors
8.	PSA
9.	Lifetime-Management
10.	Thermal Hydraulic Analyses (Transients, Accidents)
11.	Safety concepts, Defense-in-Depth
12.	Core Behavior (operational and accident conditions)
13.	Emergency Preparedness
14.	Decommissioning and Waste Management

The new ETSON members (AMEC-RSD and MTA-EK) nominated experts for the different working groups.

The TBRS organized in 2015 a dedicated workshop on earthquake, floods and strategies in case of Loss of Offsite Power, Station Black Out or Loss of Ultimate Heat Sink. This workshop took place on May 11-12 in Paris and allowed ten ETSON members to compare their approaches on these natural hazards and their consequences. The final main purpose of this meeting is to propose in the future an unified and coherent methodology between ETSON members. In conclusion, the participants highlighted the following points.

Concerning hazards, the approaches used nowadays are mostly deterministic or based on a mix of statistical evaluations and deterministic margins. The discussions highlighted the need to develop knowledge and to share information on the probabilistic evaluations of flood and earthquake, in order to be able to use both deterministic and probabilistic evaluation during the safety evaluation.

Further discussions are still needed to better understand the methods used by the different partners, applicability of the methods to the different countries, need to develop new methods.

This report could as well be used to define subjects where additional discussions are needed to reach common positions (such as definition of flood or earthquake levels, database on equipment's robustness, etc.), identify what problematic issues do not have sufficient methodological support or are not supported by actual data; then, priority areas for research on national as well.

as international levels could be proposed by ETSON members.

The Group on Nuclear Waste and Decommissioning organized a meeting in Vienna (14th and 15th of May). The work program was:

- Sustainable radioactive waste management processes - including innovative techniques

A list of the different types of waste has been studied to order them following the TSO interests (depleted uranium, MOX, graphite waste, sealed radiation sources...). A questionnaire will be filled by each member to agree the areas for focus.

- Hazard management during the operational phase of a geological disposal facility

This point has been postponed for a next meeting.

- Strategies for the decommissioning of nuclear facilities

The issues of entombment as a decommissioning option had been considered. Several safety requirements such as the need for proper siting studies, radioactive waste characterization, radiological impact assessment, provision of multiple safety functions, safety case development etc. have been highlighted. ETSON will prepare a position paper.

- Three year timeframe, topics conducted in parallel

An international seminar is planned in 2016 before to compile and publish the TSOs positions on these topics.

2.2

ETSON Publications

Technical Safety Assessment Guides (TSAG):

In 2015 ETSON maintained efforts on finalisation and publication of technical assessment guides.

In 2015 the TSAG dedicated to "Safety Fluid System" has been released .

The results of the workshop dedicated to natural hazards (May 2015) has been released under the TSAG format.

Overview on the assessments of Earthquake/Flood and Provisions in case of Station blackout (SBO) or Loss of ultimate heat sinks (LUHS), in the light of Fukushima accident.

All the published TSAGS can be freely downloaded on ETSON website (www.etsion.eu).

A Russian translation of the TSAGs will be soon available.

2.3

ETSON Research Group

ERG presented a paper at the 2015 Eurosafe Conference "ETSON views on R&D priorities for implementation of the 2014 EURATOM Directive on safety of nuclear installations".

The main conclusions of this paper show that :

- Many R&D highest priority needs that were identified in the 2011 ETSON position paper already contribute to the objectives of the

new 2014 Euratom Directive on the safety of nuclear installations.

- The ETSON members have been strongly involved for many years in R&D projects related to the improvement of safety of the European NPPs (e.g. SARNET) and this situation was even reinforced after the Fukushima – Daiichi accident in 2011.
- To date, ETSON members are involved in many R&D projects, either international (FP7/H2020 Euratom or OECD/NEA/CSNI) or in a national frame, aiming at preventing accidents through defence in depth and at avoiding radioactive releases outside a nuclear installation.
- These 3 points will help to better answer the main objectives of the 2014 Directive

The ERG will organized in June 2016 a dedicated workshop "In-vessel Corium retention" Aix-en-Provence.

ETSON Research Group is in charge of ETSON coordination concerning the H2020 call. An update of ETSON R&D priorities is planned for 2016.

2.4 ETSON Knowledge Management

The KMG organized a meeting the 2nd of November 2015.

The ETSON intranet is fully operational with an update of the security.

An infopool section has been created to share general information, publications,

events, conferences materials etc.). This infopool can be considered as a first step for the ETSON Database.

The KMG will collect the information from the ETSON members to propose an "identity table" with all members relevant information (specialties, areas of expertise...).

2.5 ETSON PING

The Project Initiation Group (PING) decided to work more closely with Riskaudit to facilitate consortia creation. Riskaudit is a European Economic Interest Grouping (EEIG) owned by IRSN and GRS, which operates European assistance projects.

The PING also recommended that, in order to promote the European nuclear safety approach, the European tenders should make reference to the ETSON guides.

2.6 ETSON JSP

The ETSON Junior Staff Programme (JSP) brings together young experts from all ETSON members and associates. The JSP aims at improving the long-term partnership of the member TSOs, establish a network for cooperation between young expert from different countries, and to encourage intercultural interaction. This network has long term objectives to allow young researchers to

learn to work together and to maintain the contacts in the duration.

The main yearly event within this framework is the ETSON Junior Staff Summer Workshop.

JSP SUMMER WORKSHOP 2015 (23-28.08.2015)

- Subject: Material properties in nuclear safety
- Attendees: 26 from 10 TSOs
- Lectures and working groups: 32 presentations by the young professionals themselves
- Location: Villingen in Switzerland, hosted by Paul Scherrer Institute

AMEC-RSD (United Kingdom) proposed to host the ETSON JSP Summer Workshop 2016. The subject will be dedicated to Structural Integrity aspects in nuclear safety. It will be held from 4th to 9th September 2016 in the AMEC offices, Warrington, UK



JSP in Switzerland (August 2015)

2.7

ETSON Workshops

The TBRS organized a workshop dedicated to natural hazards and the consequences on nuclear safety (see 2.1 for more details).

2.8

ETSON Award

The 2015 ETSON Award has been attributed to MM. Heckmann (GRS) and Saifi (VTT) for their work on *Comparative Analysis of Deterministic and Probabilistic Fracture Mechanical Assessment Tools*.

The two authors received the price of 2500 € to share between them during the 2015 EUROSAFE Forum meeting in Brussels.



ETSON RELATED INITIATIVES

As part of their activities, ETSON members have been involved in different initiatives in 2015.

3.1 EUROSAFE Forum

The EUROSAFE Forum took place in Brussels in November 2015 (2nd and 3rd). The main topic for the forum was "Implementing the 2014 European directive: nuclear safety and security challenges ahead".

3.2 EUROSAFE Tribune

ETSON members participated in the publication of two issues of the EUROSAFE Tribune in 2015:

- EUROSAFE Tribune #27, published in July 2015. The overall theme of this issue was: "International cooperation in a post-Fukushima era".
- EUROSAFE Tribune #028, published in October 2015. This issue focusses on "Severe accident management : new directives, new questions, new research".

The EUROSAFE Tribune #029 (Implementing the 2014 European Nuclear Safety Directive) is in preparation. A reflection is in progress between EUROSAFE members about the future orientations of the Tribune.

ENSTTI

Year after year, ENSTTI's training and tutoring offering goes on expanding to cover the diversity of the needs in nuclear safety, nuclear security and radiation protection. In 2015, ENSTTI welcome 980 trainees and uses a pool of lecturers counting more than 150 international experts.

ENSTTI asked all ETSON members to check if all their areas of expertise are well covered. ENSTTI will propose dedicated actions to harmonize the level of knowledge between ETSON members.

4 ETSON EXTERNAL RELATIONS

4.1 European institutions

The ETSON General Assembly recognized the need to consolidate the relations with the European Commission.

ETSON is in contact with the European Commission. The Commission is in complete agreement with the ETSON approach to harmonize nuclear safety in Europe from a technical basis. Although nuclear safety is a national prerogative of each state, ETSON members can work together to consolidate harmonization with common approaches among TSOs. This work is in connection with the implementation of the new safety directive and of the radioactive waste directive. ETSON could propose its expertise as a facilitator for the European countries to implement the directives at national level. ETSON could also have a role in the field of standardization in the nuclear sector

4.2 IAEA

ETSON took part in the following IAEA activities:

- TSO Forum: Vienna 26-27 March 2015

Eight ETSON members participated to the 7th Steering Committee of the TSO Forum.

Several actions/recommendations have been defined after the TSO Forum with :

- Sharing information on international R&D initiatives to which TSOs contribute. A dedicated space on TSO website will be developed to centralize all the relevant information.
- Exchange of information concerning IAEA R&D actions.
- Development of a reference document on good practices of the management and implementation of international R&D projects with benchmarking with the different tools.
- Finalization of the DPP about TSOs role and function.
- Dissemination of document on safety/security interfaces.
- Development of the TSO website with creation of dedicated subportals
- Develop TSO-Network interactions

- General Conference: Vienna 14-18 September 2015

A side event has been organized by the FORO where M. Repussard presented ETSON. The idea is to have regular contacts between the two organizations (exchange of information, documents, guides, TSAGs, observers,...).

An ETSON/ENSTTI booth was installed during the General Conference to promote the TSOs actions.

- TSO Forum: Vienna 12-13 October 2015

Eight ETSON members participated to the 7th Steering Committee of the TSO Forum.

Actions were decided in particular to:

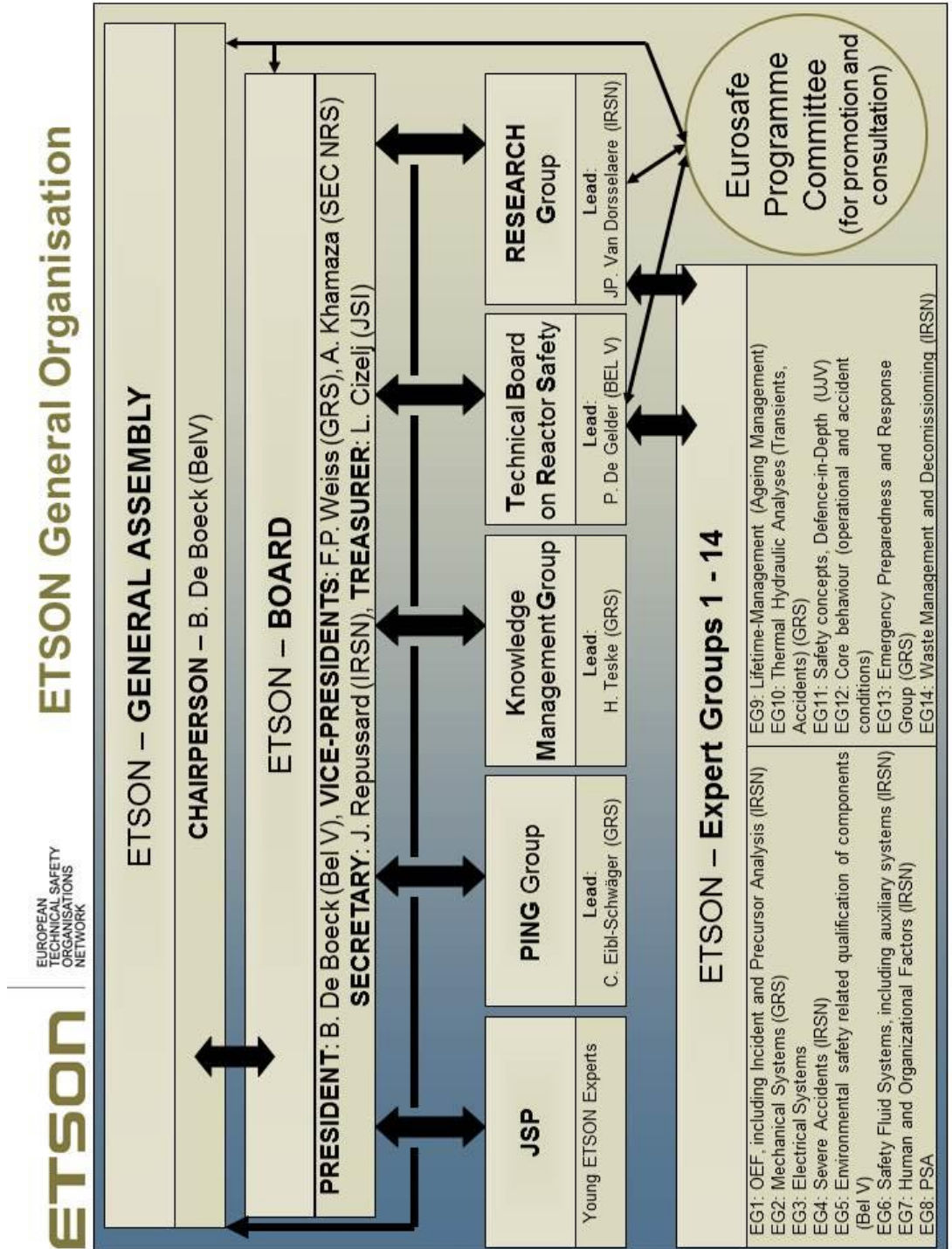
- Facilitate the provision of TSOs support to countries developing their

safety infrastructure and support the establishment of national TSOs.

- Develop a list of TSO experts available for capacity building activities.
- Work on TSO members' needs in research and development.

5 ANNEX

Annex : 2015 ETSON organization



ETSON

EUROPEAN
TECHNICAL SAFETY
ORGANISATIONS
NETWORK

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