

INTERNATIONAL TRIP REPORT: Paris, France

Travelers, Titles and Affiliations

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Subject

RES staff participated in the Organisation for Economic Co-operation and Development (OECD) Task Group for Meeting of the High Energy Arcing Faults (HEAF) as well as the 18th meeting of the OECD FIRE Project Review Group on September 24-26, 2012.

Dates of Travel, Countries and Organizations Visited

Paris, France
OECD Conference Center: September 24-26, 2012

Desired Outcome

This travel served two purposes.

- 1) Participation in the OECD High Energy Arcing Faults (HEAF) panel and planning meeting, where the status of the current efforts was presented and issues related to equipment donation were discussed. The updated test plan for the upcoming High Energy Arc Fault testing was presented to the member countries in order to gauge further interest and obtain status of any possible donations towards the project in the form of equipment or monetary contributions. The member countries also discussed potential challenges with equipment donation. These challenges in part include potential delays and cost associated with U.S. Customs tariff and duty import fees.
- 2) Participation in the OECD Fire database planning meeting, where the status of the current efforts were presented and planning of future meetings and efforts were discussed. Members provided feedback to High Energy Arcing Fault Topical Report which will be published in late 2012

Summary of Trip

OECD HEAF Meeting

The OECD FIRE Project Review Group and focused on refining the proposed outline for the official project report. This effort was led by Marina Rowekamp from Germany Following introductions and adoption of the agenda, the meeting began with a Review of actions from the 18th FIRE meeting in order to close out any long-standing issues and reschedule the topical report publication date. One item from the last meeting on which we reached consensus was the definition for the coding field, "Proposed direct effects (failure of safety-related systems) vs.

indirect (effect on response systems, like flooding) vs. Consequential effects (effect process as a result of direct effects).” The group consensus definition was:

Direct Effects – Impact to an object (i.e., structure or component) due to heat or combustion byproducts (e.g., smoke, humidity, etc.) from a fire.

Indirect Effects – Impact or consequences, other than those caused by heat or combustion byproducts (e.g., smoke, humidity, etc.), to systems, structures, or components due to fire and response to the fire (e.g., damage due to flooding from firefighting activities); equipment intentionally de-energized in order to facilitate firefighting efforts.

Consequential Effects – Consequences arising due to the *Direct Effects* of fire (e.g., spurious activation of equipment due to fire damage to cables).

These definitions were used by the member countries and the project contractor, Wolfgang Werner, to recode each individual fire event in order to ensure consistency when moving forward.

The fire members spent the remainder of the day discussing various issues associated with the OECD fire events database project frequency analysis. There is a current effort to focus on the possibility of moving to component specific initiator frequencies instead of plant specific frequencies. To accomplish this goal all member countries were asked to provide an all inclusive list of component counts from both PWR and BWR plants. When this list has been completed (next meeting) the panel will discuss the potential applicability of this data and the challenges associated with the application of this data. The U.S. Nuclear Power Industry in cooperation with EPRI is concurrently looking at the possibility of moving to component based frequency values as well.

The group next discussed the high energy arcing fires (HEAF) Topical report. This report compiles all possible HEAF events that have occurred in every member country, along with a brief description of the event. It was the interest in this report that spurred the creation of the Task Group for Meeting of the High Energy Arcing Faults, which met the previous day, as well as the evolution of the Conceptual Test Plan for High Energy Arcing Faults Fire Experiments, which was prepared in coordination with Sandia National Labs (U.S. NRC Project Code: JCN N6981). The Japanese panel member Tsuyoshi Uchida agreed to update his section of the report to include a more detailed analysis of the High Energy Arcing Fault that occurred at the Onagawa plant due to the seismic event on April 11, 2011. This report is in its final stages, and is being distributed for comment by the member countries as well as by interested affiliates. The report should be published in November 2012.

This topic lead to the next phase of the HEAF project The NRC gave a presentation of the Updated Conceptual Test Plan for High Energy Arcing Faults Fire Experiments, prepared in coordination with Sandia National Labs (U.S. NRC Project Code: JCN N6981). This test plan has been revised in the past 6 months to reflect changes the project and project timelines. The NRC discussed several logistical issues that have arisen due to legal matters with equipment donation and shipment. The NRC also explained the lessons learned to the panel members; the objectives, overview of testing needs, experimental approach, proposed test facilities/limitations, and desired test matrix. The main goal of this presentation was to share information on project changes, explain current testing work that has already taken place and keep the member

countries involved and moving forward with the equipment donation process. The NRC also distributed an information request concerning the equipment to be donated. The example template is attached

This HEAF discussion concluded with an overview of the equipment that is currently being contributed to the project from each member country.

<p>CONTRIBUTIONS FROM SIGNATORIES Central Research Institute of Electric Power (CRIEPI), Japan Japan Nuclear Energy Safety Organisation (JNES), Japan</p>	<p>CRIEPI shall provide the following as Contributed Equipment: 1) Metal Clad Switchgear Cabinet (M/C); Type:VF-40 DM-BA (4 cabinets) Rated Voltage: 6,9 kV Rated Frequency: 50Hz Rated Short-Time Withstand Current: 40kA, 2s JNES shall be responsible for delivering the Contributed Equipment from Japan to NIST, USA</p>
<p>Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH, Germany</p>	<p>1) 6.9 kV Switchgear (size: ~1.0m x 1.2m x 1.1m) 2) Transformer (size: ~1.5m x 1.8m x 1.0m ; weight ~6 t) GRS shall only be obliged to support the transfer of the components, including payment of costs therefore, to the Operating Agent. The transfer of ownership, the shipping, the treatment after finalisation of the project etc. may be stipulated in an additional contract between the Operating Agent and the owner of the components</p>
<p>Korea Institute of Nuclear Safety (KINS), Korea (Republic of)</p>	<p>1) Class "M" Metal-Clad Medium Voltage Air Break Switchgear (GEC 480V) 2) Type DS Metal-enclosed Low Voltage Power Circuit Breaker Switchgear (DS 416, Westinghouse 480V) 3) Class E7 & E8 High Voltage Air Breaker Switchgear (GEC 6900V) 4) Procel-line Type CHP Magnetic Air Circuit Breakers (Westinghouse 6900V)</p>
<p>The Institut de Radioprotection et de Sûreté Nucléaire (IRSN), France</p>	<p>1) Two 7,2 kV Switchgears, rated current 1250A, rated frequency 50Hz (size ~0.5m x ~0.6m x 1.0 m – weight ~150 kg) 2) One 7,2 kV Switchgear, rated current 1250A, rated frequency 50Hz (same characteristics that (1) but reinforced, size ~1.3m x ~0.7m x 1.6 m – weight ~350 kg) 3) One 7,2 kV Switchgear, rated current 3150A, rated frequency 50Hz (size ~0.5m x ~0.7m x 1.0 m – weight ~170</p>

In addition to this equipment list the panel member from Finland Lasse Tunturivuori also mentioned that he is in discussions with various interested parties in donating equipment to the project. The only limitation for this equipment was in the legal nature and we are confident that the channels we have been following with the German plants will also work to obtain these additional items.

Another point of discussion related to the HEAF project was the ease of sharing large amounts of data quickly. The member countries will not only be donating equipment but will also be bringing a vast amount of industry expertise to the table, our goal is to put this expertise to work. In order to keep all the member countries involved with the testing process and current work the NRC will be working with the OECD/NEA website staff in order to set up a SharePoint like site to distribute information. The website will be open to all member countries participating in the project.

After the discussion of the HEAF project concluded the panel members moved on to discuss the other various topical reports that are currently being worked on, such as:

1. Topical Report on Fire Protection Regulations
 - a. This topical report will provide a summary of the various member countries regulatory history and regulatory requirements as they relate to probabilistic risk assessment. The NRC has volunteered to provide a sample template for each member country by December 14th of this year
2. Topical Report on Root Causes of Fire Events
 - a. This topical report is still in a preliminary format. ES consult is to provide a general structure of the report as well as a timeline by the next meeting

The FIRE meeting was concluded with a discussion as to future meeting dates and locations. It was decided that the next update to the database will occur six months from this meeting, and that member countries will need to input the data two weeks prior to the next meeting, which was tentatively set for March 6-8, 2012. Distribution of the next version of the database will occur prior to this meeting.

Pending Actions/Planned Next Steps for NRC

1. Update the OECD fire events database with events which occurred in the past year and backdate events to 1990 before the next meeting.
2. Distribute the HEAF topical report for review and comment
3. Provide a sample template for the Topical Report on Fire Protection Regulations
4. Establish Sharepoint site with the OECD/NEA

Points for Commission Consideration/Interest

This trip did not result in any points of interest for the Commission.

Attachments

Agenda for the 18th Meeting of the OECD FIRE Project

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