CIGRE Study Committee C2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP[1]

WG N°C2.24	**Name of Convenor:** Frank Crisci (AUSTRALIA) **E-mail address**: frank.crisci@sapowernetworks.com.au
Strategic Directions #[2]: 2	**Technical Issues #[3]:** 5
The WG applies to distribution networks[4]: Yes	
Potential Benefit of WG work #[6]: 1, 6	
Title of the Group: Mitigating the risk of fire starts and the consequences of fires near overhead lines for System Operations	

Scope, deliverables and proposed time schedule of the Group:

Background:

History shows that on high fire-risk days, electricity networks start bushfires/wildfires. The risk of this can be mitigated if utilities shut down power pre-emptively. However, electricity is vital to the safety of the community and its absence increases the risk to public safety and public health.

In 1988, legislation was proclaimed in South Australia which gave electricity utilities authority to switch off electricity, with immunity, when the utilities form the opinion that it's necessary to do so to avert danger to person or property. By contrast the California Public Utilities Corporation in 2009 rejected San Diego Gas and Electric's proposal for similar legislative approvals. Also, despite the findings that a number of the disastrous 2009 Black Saturday bushfires in Victoria were caused by electricity lines, the affected communities rejected any proposal to switch off power to avoid a bushfire on high fire-danger days.

Enquiries into catastrophic fires have shown that electricity assets start fires in areas where extreme fire-danger conditions occur. Whilst this could be avoided by switching off power, it's acknowledged that doing so would have a significant impact on the safety and well-being of the affected communities. Hence the challenge for the electricity industry on extreme fire-danger days is to balance the need to leave powerlines energized against switching off power to minimize fire start risk

In this context, fire-risk weather is defined as the type of weather that directly affects the risk and behaviour of fires.

This worldwide study aims to collate the decision-making frameworks used by utilities to address this dilemma. This working group will address the impact on system operations caused by bushfires (wildfires) and fire-risk weather, in relation to:

- Operational decision-making and risk assessment
- Methods to guarantee network security

The study will include the following aspects regarding the additional risk of fire or fire occurrence:

- The impact of line design/construction standards on operational decision-making.
- The impact of applicable Regulatory frameworks for operational management of fire and weather risk management
- Fire propagation modeling to assist in decision-making
- The fire-risk weather and impacts on electricity grids
- Fuel curing and satellite data

- Line construction options to reduce operational risks associated with fire- and fire-risk weather
- Methods to interact with external parties during operational timeframes when creating safety conditions and mitigating impact
- Impact of fire close to transmission lines – air de-ionization, flashover
- Bushfire characteristics and potential impacts on overhead line performance

Scope:

To conduct a survey of the decision-making processes and the measures implemented by utilities with major fire-start risks, in order to mitigate the consequences of disturbances caused by fire.-.

The study will be staged as follows:

1. Develop a suitable survey for the study
2. Issue to relevant Cigre member utilities
3. Collate the survey results
4. Report findings
5. Develop recommendations and guidelines for decision making in relation to the risk of fires.

Deliverables:

☒ Technical Brochure and Executive summary in Electra

☒ Electra report

☒ Tutorial[5]

Time Schedule: start: November 2017 **Final Report**: September 2019

Approval by Technical Committee Chairman:

Date: 20/11/2017

Notes: [1] or Joint Working Group (JWG), [2] See attached Table 2, [3]See attached Table 1, [4] Delete as appropriate, [5] Presentation of the work done by the WG, [6] See attached table 3

Table 1: Technical Issues of the TC project "Network of the Future" (cf. Electra 256 June 2011)

1	Active Distribution Networks resulting in bidirectional flows
2	The application of advanced metering and resulting massive need for exchange of information.
3	The growth in the application of HVDC and power electronics at all voltage levels and its impact on power quality, system control, and system security, and standardisation.
4	The need for the development and massive installation of energy storage systems, and the impact this can have on the power system development and operation.
5	New concepts for system operation and control to take account of active customer interactions and different generation types.
6	New concepts for protection to respond to the developing grid and different characteristics of generation.
7	New concepts in planning to take into account increasing environmental constraints, and new technology solutions for active and reactive power flow control.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics.
9	Increase of right of way capacity and use of overhead, underground and subsea infrastructure, and its consequence on the technical performance and reliability of the network.
10	An increasing need for keeping Stakeholders aware of the technical and commercial consequences and keeping them engaged during the development of the network of the future.

Table 2: Strategic directions of the TC (ref. Electra 249 April 2010)

1	The electrical power system of the future
2	Making the best use of the existing system
3	Focus on the environment and sustainability
4	Preparation of material readable for non-technical audience

Table 3: Potential benefit of work

1	Commercial, business or economic benefit for industry or the community can be identified as a direct result of this work
2	Existing or future high interest in the work from a wide range of stakeholders
3	Work is likely to contribute to new or revised industry standards or with other long term interest for the Electric Power Industry
4	State-of-the-art or innovative solutions or new technical direction
5	Guide or survey related to existing techniques. Or an update on past work or previous Technical Brochures
6	Work likely to have a safety or environmental benefit