CIGRE Study Committee B2

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG* N° B2.59	Name of Convenor : Dale Douglass (USA)
Technical Issues # (2): 5, 9	**Strategic Directions # (3): 2, 3**
The WG applies to distribution networks: No	
Title of the Group: Forecasting Dynamic Line Ratings	

Scope, deliverables and proposed time schedule of the Group :

Background :

The technical background and industry needs are described in publications:

- TB299 "Guide for selection of weather parameters for overhead conductor ratings", published in 2006.
- TB498 "Guide for Application of Direct Real-Time Monitoring Systems", published in 2012.
- Electra Article "Real-time Line Monitoring", WG 22.12, published 2006
- COST Action ES1002, "FORECASTING FOR DYNAMIC LINE RATING", April 2014
- "TWENTIES Project", Final Report

As listed above, many documents have recognized the advantages of calculating variable line ratings based on real-time weather measurements in the line corridor since such ratings are typically well above static line ratings. Unfortunately, the lack of line rating forecasting methods, both in the short term (up to 4 hours) and, for marketing, maintenance, and operations planning, in the medium term (up to 48 hours), has limited the application of dynamic line ratings.

Scope :

Needs of Target Groups :

1. Use dynamic overhead line ratings to relieve constraints on renewable generation and bulk power flow.

2. Explore methods that allow both short-term and medium-term forecasting of variable/dynamic line ratings to encourage use by system operations.

The WG will review the full range of available methods for forecasting variable overhead line ratings, identifying practical methods on the basis of probable risk and benefit comparisons. The accuracy of rating predictions over the short (up to 4 hours) and medium term (up to 48 hours) will be considered.

Both "line-specific" and "system-wide" variable line rating methods will be considered and, while specific forecasting methods will be described and compared, the main goal is to clarify how the various approaches can be compared on the basis of probabilistic risk and benefit. We will coordinate our efforts with other CIGRE study committees such as system operations and meteorology.

The resulting document will consider line engineering concerns (aging of joints and conductor, sag clearance) and the needs of present and future system operations (rating variability and persistence, ease of incorporation into operational displays, fit-in with the evolution of transmission/distribution grids: development of intraday market, active network management (ANM), evolution of N-1 doctrine,…), and the ability of atmospheric scientists to predict weather parameters both within line corridors and system-wide up to 48 hours ahead ("ensemble" forecasts, a concatenation of different models with varying input conditions, which deliver also information about the uncertainty of the results). In particular the document will:

a.	Describe dynamic line rating forecast alternatives for periods up to 48 hours ahead.
b.	Outline a method of probabilistic risk comparison for forecasted line ratings.
c.	Compare line-specific, terrain-specific solutions to system-wide forecasts.
d.	Evaluate the importance of measurement and calculation errors on forecasting line ratings.

Deliverables : TB and related Electra paper

Time Schedule : **Start :** August 2014 **Final report** : December 2016

Comments from Chairmen of SCs concerned :

Approval by Technical Committee Chairman :

Date : 30/06/2014

M. Wald

(1) Joint Working Group (JWG) - (2) See attached table 1 – (3) See attached table 2
(4) Delete as appropriate

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 within distribution level and to the upstream network.
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 (cf. 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