CIGRE Study Committee C3-22

PROPOSAL FOR THE CREATION OF A NEW WORKING GROUP

WG [1]N° C3.22	**Name of Convenor: Mortier Johan** (Belgium) **E-mail address**: johan.mortier@elia.be
Technical Issues #[2]: 7	**Strategic Directions #[3]: 3**
The WG applies to distribution networks[4]: Yes	
Potential Benefit of WG work #[5]: 7	
Title of the Group: Vegetation management in substations	

Scope, deliverables and proposed time schedule of the WG:

Background:

The use of gravel surfacing under and nearby high voltage equipment in substations combined with herbicide treatment has been in many countries for many years the preferred option for limiting vegetation. Solid surfacing does not avoid the upcoming of vegetation either and is often treated with herbicides. Gravel surfacing has many good design and maintenance characteristics including: infiltrating rain, easy to move and replace, improving electrical isolation, solid surface for equipment, reasonable cost. A neat cover, when regularly maintained with herbicides, helps to avoid weed growth, and thus limits the risk of fire.

Glyphosate containing herbicides have been the most efficient and widely used curative herbicides used on gravel surfacing in substations. For several years there has been a strong trend to limit or ban glyphosate and other kinds of herbicides. Many countries, states, cities and other jurisdictions legally imposed restrictions and there is a stronger environmental awareness within many TSO and DSO companies. Herbicide leaching into storm water drainage and other water bodies has health, environmental and legal risks. Furthermore, the willingness of manufacturers to look for new alternative herbicides is declining and over the years more and more species have developed immunity towards herbicides.

When the use of herbicides in substations is stopped or phased out, it is important to have a clear understanding of how the growth of weeds and other vegetation can be managed in order:

- to maintain safe clearances to electrical equipment,
- to minimize hindrance of these weeds for workers,
- to take in account consequences on security matters, as vegetation can block a clear view or interfere with detection equipment,
- to limit the risk of electrical shock to workers due to the reduced resistance / isolation when standing in weeds and grass compared with formerly neat gravel.

The ban of herbicides will likely stimulate biodiversity in substations, which perhaps can cause additional problems / risks not encountered before such as attracting more animals like mice, snakes, rabbits and their predators (fox, owl, …), but also teaks (Lyme's disease, …).

Scope and objective:

1. Define clearly what is meant by surfaces of the substation (gravel, grass, meadow, concrete, bricks, …) and what is to be considered as belonging to this subject (exclusively inside the substation's fence, including a minimum distance outside the

fence, surface of the public domain outside the fence that has to be managed or not, …); also on the different materials used as surface, the types of vegetation that cover these surfaces;

2. Analyse the main design and maintenance issues (legal constraints, safety, environment, ...) that drive TSO's and DSO's to tackle this topic and identify their concerns and difficulties;

3. Collecting know how and best practices regarding types of surfaces and vegetation control in substations, the ways of maintaining the surface, the equipment used, the types of herbicides used and in particular the motivation for continuing or stopping the use of herbicides;

4. Compile experiences of DSO's and TSO's on abandoning the use of herbicides (the Working Group will not conduct R&D studies or experiments);

5. Identify and evaluate design and maintenance alternatives for herbicide use in substations, particularly on gravel. This will include: evaluation of their efficiency, mitigation of potential negative effects, cost elements, monitoring and reporting.

6. Explore partnerships with local and / or regional authorities, service providers, natural scientific bodies and NGO's to develop new approaches for vegetation management, with the objective to reduce or phase out the use of herbicides, while still maintaining the operational and safety standards required in substations.

The work will consider existing as well as new substations.

If relevant, the Working Group will also consider the effects of the reduction or ban of herbicides on animals detrimental to substations and their equipment, implicating the increased use of other pesticides.

This working group will take into account the work published in TB 767 ("Vegetation fire characteristics and the potential impacts on overhead line performance") and that of WG B2.73 on the prevention of vegetation fires, caused by overhead lines. The relation with SC B3 (substations) is managed by our ambassador there, Warren Funston.

Deliverables:

☒ Technical Brochure and Executive Summary in Electra

☒ Electra Report

☒ Tutorial[6]

☐ Webinar[6]

Time Schedule: start: August 2020 **Final Report**: August 2023

Approval by Technical Council Chair:

Date: December 23, 2019

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

Table 1: Technical Issues for creation of a new WG

1	Active Distribution Networks resulting in bidirectional power and data flows within distribution levels up to higher voltage networks
2	Digitalization of the Electric Power Units (EPU): Real-time data acquisition includes advanced metering, processing large data sets (Big Data), emerging technologies such as Internet of Things (IoT), 3D, virtual and augmented reality, secure and efficient telecommunication network
3	The growth of direct current (DC) and power electronics (PE) at all voltage levels and its impact on power quality, system control, system operation, system security, and standardisation
4	The need for the development and significant installation of energy storage systems, and electric transportation, considering the impact they can have on the power system development, operation and performance
5	New concepts for system operation, control and planning to take account of active customer interactions, and different generation types, and new technology solutions for active and reactive power flow control
6	New concepts for protection to respond to the developing grid and different generation characteristics
7	New concepts in all aspects of power systems to take into account increasing environmental constraints and to address relevant sustainable development goals.
8	New tools for system technical performance assessment, because of new Customer, Generator and Network characteristics
9	Increase of right of way capacity through the use of overhead, underground and submarine infrastructure, and its consequence on the technical performance and reliability of the network
10	An increasing need for keeping Stakeholders and Regulators aware of the technical and commercial consequences and keeping them engaged during the development of their future network

Table 2: Strategic directions of the Technical Council

1	The electrical power system of the future: respond to speed of changes in the industry
2	Making the best use of the existing systems
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, social and economic benefits 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 directions
5	Guide or survey related to existing techniques; or an update on past work or previous Technical Brochures
6	Work likely to contribute to improved safety.
7	Work addressing environmental requirements and sustainable development goals.