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UIE WG 2 POWER QUALITY: RECOMMENDATIONS TO THE STAKEHOLDERS ON VOLTAGE DIP IMMUNITY OF EQUIPMENT AND INSTALLATIONS (AFTER THE CIGRE/CIREN/UIE JOINT WG C4.110)

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ABSTRACT: In October 2009, UIE established Working Group 2 (WG2) to work in the area of Power Quality and to continue with the dissemination and further development of the results produced by the former joint CIGRE/CIREN/UIE WG C4.110. The final results of the work in UIE WG2 will be presented in May 2012 at the XVII UIE Congress in St. Petersburg, including the delivery of a Tutorial on Voltage Dip Immunity of Equipment and Installations, as well as the presentation of the three papers on relevant topics. This abstract briefly summarizes the main recommendations on voltage dip immunity, conveyed in the form of the messages to the relevant stakeholders: regulators; standard-setting organizations; network operators; industrial customers; small/medium size enterprises and domestic customers; equipment manufacturers; manufacturers of power quality monitoring equipment; educators; and researchers. The full paper will discuss all these recommendations in more detail.

INTRODUCTION

The Joint Working Group (JWG) C4.110, which was sponsored by CIGRE, CIREN and UIE, was active between 2006 and 2009. The JWG C4.110 has considered and discussed a number of aspects of immunity of equipment and installations against voltage dips, and produced a Technical Report/Brochure, which is distributed by both CIGRE and UIE, [1]. In order to continue with dissemination and further development of the results produced by the JWG C4.110, the UIE established Working Group 2 (WG2) in the area of Power Quality in October 2009. The final results of the work in UIE WG2 will be presented at the XVII UIE Congress in St. Petersburg in May 2012, for which three papers and a tutorial are planned and submitted. This abstract briefly summarizes one of the proposed papers, which will discuss main recommendations of UIE WG2 on voltage dip immunity to relevant stakeholders, [2].

RECOMMENDATIONS TO THE REGULATORS

In the UIE WG2 message to the regulators, the following main recommendations are provided: a) voltage dips occur as a part of the normal operation of power systems; b) voltage dips should be monitored and recorded; and c) regulators should provide incentives for facilitating monitoring of voltage dips by network operators.

RECOMMENDATIONS TO THE STANDARD-SETTING ORGANISATIONS

In the message to the standard-setting organisations, the UIE WG2 stipulated following main recommendations: a) apart from remaining/residual dip voltage and total dip duration, other characteristics of voltage dips should be considered; b) standard methods should be defined for characterising both balanced and unbalanced voltage dips, including balanced

three-phase dips; c) the results from voltage dip surveys should suitably present statistics on balanced and unbalanced dips; and d) voltage dip immunity labels, which combine immunity classes and performance criteria, can be used to assess dip immunity of various equipment.

RECOMMENDATIONS TO THE NETWORK OPERATORS

The UIE WG2 made following recommendations to the network operators: a) customers need data on number and severity of voltage dips to improve immunity of their equipment and processes; b) due to possible serious economic losses, voltage dips are of main concern for industrial customers; and c) mutual understanding of origins and consequences of voltage dips is essential for improving the compatibility between the network and industrial installations.

RECOMMENDATIONS TO THE INDUSTRIAL CUSTOMERS

The main recommendations stated by the UIE WG2 to industrial customers are: a) voltage dips occur as a part of the normal operation of power systems; b) economic considerations are basis for improving the immunity of an industrial installation/process against voltage dips; c) voltage dips should be considered during the design of an industrial installation; and d) cooperation between process and electrical engineers is essential to resolve dip problems.

RECOMMENDATIONS TO THE EQUIPMENT MANUFACTURERS

The following main recommendations are formulated by the UIE WG2 to the equipment manufacturers: a) voltage dip immunity should be considered at an early stage of design and development of new equipment; b) in order to select suitable equipment, customers need to know dip immunity of the manufactured equipment; and c) as voltage dip immunity labels simplify communication between equipment manufacturers and their customers, equipment manufacturers should get involved in the further development of voltage dip immunity labels.

RECOMMENDATIONS TO MANUFACTURERS OF MONITORING EQUIPMENT

The main recommendations of the UIE WG2 to the manufacturers of power quality monitoring equipment and software are: a) all types of balanced/unbalanced dips should be clearly distinguished in a three-phase supply systems; b) suitable methods for extracting additional dip characteristics from recorded waveforms should be developed; and c) suitable methods for presenting dip statistics (e.g. contour charts and percentiles) should be devised.

RECOMMENDATIONS TO OTHER STAKEHOLDERS

Due to the space limitation for this abstract, the recommendations of the UIE WG2 to the other mentioned stakeholders will be presented and discussed in the full version of the paper.

CONCLUSION

Immunity of equipment and installations against voltage dips is an important factor for improving overall compatibility between the electricity systems and supplied customers (e.g. those operating various industrial processes). In order to be correctly understood and resolved, voltage dip immunity issues require involvement of a number of different stakeholders, which have been directly addressed by the UIE WG2 in its messages and recommendations to the stakeholders. While this abstract provides only a brief summary, the full paper will present and discuss all UIE WG2 recommendations in more detail.

REFERENCES

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2. UIE Working Group 2 Power quality: Messages to the stakeholders// [Available Online] <http://www.uie.org/powerquality>