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| C:\Users\tarykin\Desktop\LOGO-Full Wording-P301.jpg | **World Association of Nuclear Operators**  **Moscow Centre**  **WANO – MC**  25 Ferganskaya, Moscow, 109507, Russia  Phone. +7 495 376 15 87  Fax: +7 495 376 08 97  [info@wanomc.ru](mailto:info@wanomc.ru) |

**REQUEST**

**to provide technical and organizational information via WANO.**

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| 1. NPP/Organization: Bushehr NPP IRAN (Request Number BNPP2022.Rq03 eng) |
| 1. The topic of information request: Technical Problems of using the insulation resistance measurement device “XM200” on the DC bus bars |
| 1. The goal of information request: Reduce the voltage asymmetry on the positive and negative bus bars at the Bushehr-1 nuclear power plant. |
| 1. The describing of problem:   In the Bushehr-1 nuclear power plant, the Insulation resistance of the DC bus bars and consumers of these bus bars are regularly and continuously monitored and measured by using the insulation resistance measurement device XM200 for bus bars and the XD312 device for the consumers. The XM200 device is installed between the negative bus bar and the earth in accordance with the factory documents.  Installing these devices on these bus bars causes voltage asymmetry on the bus bars (“+110 and -110” voltage symmetry would be lost) and the voltage levels reaches +190 and -30. However, voltage symmetry is restored by disconnecting the XM200 device at plant. |
| 1. Questions:   We ask you to share the experiments of your nuclear power plant about our questions in this regard as follows:   1. Do you use the XM200 and XD312 devices for monitoring the insulation resistance of the DC bus bars and their consumers in your NPPs? If yes, is the voltage symmetry as “+110 and -110” remains unchanged during their usage? 2. Have complementary equipment been used to achieve voltage symmetry? 3. What effect the voltage asymmetry has on the functionality of bus bar and its consumers? 4. Is the XM200 device installed between the negative bus bar and the earth? 5. Could distant consumers (farther than 100 meters) be covered by the XM200 device? 6. What effect the distant consumers have on decrease of insulation resistance on the bus bars?   **Paks NPP**: At the Paks Nuclear Power Plant, we do not use the XM200 and XD312 devices, we have no experience with them. Originally, used the Bender IRDH1065, IRDH365 type devices for measuring the insulation resistance. Since these devices are no longer available, they have been replaced with the Bender ISO685 type device. The Bender insulation resistance measurement device continuously switches the measuring resistance alternately to one or the other bus bar. This resistance naturally appears on the bus bars compared to the ground, but on average the voltage on the bus bars is -110V and +110V compared to the ground, if otherwise there is no insulation deterioration. |
| 1. Proposed organizations for sending this request: ALL NPPs |
| 1. Department – request initiator: Electric Management of the Bushehr-1 nuclear power plant. |
| 1. Contact details of the requester: Mr. A. Alipour , Electric Manager of the Bushehr-1 nuclear power plant. |
| 1. Date of request: 29 Sep. 2022 |

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