

# **Designated Entity Design Standards Task Force (DEDSTF) Minimum Design Requirements for FERC Order 1000 Projects System Protection Subgroup**

## **Purpose of this document**

The charge of the DEDSTF states that the purpose of the group is to establish minimum design standards to assure a minimum level of robustness is provided such that the new competitively-solicited facility (one that would require the signing of a Designated Entity Agreement) would not introduce a weak point in the system in terms of performance. These minimum design standards would only apply to projects that would require the signing of a Designated Entity Agreement (DEA).

Section 4.2 of the DEA states

*For the purposes of this Agreement, applicable technical requirements and standards of the Transmission Owner(s) to whose facilities the Project will interconnect shall apply to the design, engineering, procurement, construction and installation of the Project to the extent that the provisions thereof relate to the interconnection of the Project to the Transmission Owner(s) facilities.*

The System Protection Subgroup views this language as the basis for the minimum system protection related requirements. However, as written, section 4.2 of the DEA is in need of clarity as it relates to system protection.

## **Applicable Relay schemes under DEA 4.2**

Relay schemes applicable to DEA 4.2 are schemes that “relate to the interconnection of the Project to the Transmission Owner(s) facilities”. This refers to protection schemes to include designed to trip off any portion of the interconnection. For example, if the Project included a new substation that interconnected to a Transmission Owner line in a breaker and a half configuration, any relay schemes that trip off either line breaker would be applicable.

From DEA 4.2, applicable relay schemes must utilize the Transmission Owners(s) protection system design and engineering standards.

## **Relay “design and engineering” requirements**

The applicable system protection technical requirements and standards of the TO, as related to DEA 4.2 include:

- Relay types
- Relay scheme (POTT, current diff, etc)
- Communication media (Fiber, Power Line Carrier, etc). If the local T.O. design standards include Fiber Optic communications for all newly designed line protection, then the developer must incur the cost of any required fiber, even if the existing interconnect line does not currently have a fiber path.

- Communication scheme requirements – number of channels, channel type, general remote remote trip requirements
- Test switch requirements – the general test switch requirements of the local TO must be incorporated into the developer design. For example, the local TO may require all microprocessor relay I/O to have a test switch.
- General rack requirements. For example, the local TO may have a requirement to separate primary and backup relays on separate racks.
- Reclosing practices. Local TO will decide reclosing timing, and reclosing type (HBDL, sync check, etc)
- Breaker failure scheme design as related to the interconnection and system stability. This would include BF relay type, timing, logic, etc.

As related to the above listed bullets, the local TO has the right to require the Developer to follow local TO standards as related to the bullets listed above. The Local TO, at their discretion, may allow the Developer to utilize their own standards as related to the bullets listed above.

The requirements listed above are meant to be general in nature and must be “performance based”. The Developer has the ability to develop their own schematics, rack layout details, relay I/O, wiring drawings, etc.

#### **Relay schemes that are not applicable to DEA 4.2**

Relay schemes that are not applicable to DEA 4.2 are those schemes that do not affect the interconnection in any way. These schemes do not trip off any portion of the interconnection. For these schemes, the Developer must follow the requirements of PJM Manual 7.

#### **Relay protection review**

The substation layout and proposed relay protection for all FERC 1000 projects must be presented to the PJM Relay Subcommittee for review and approval prior to the manufacturing phase of the project.

#### **Additional requirements**

All protection schemes in the PJM footprint are required to follow the PJM Manual 7, “PJM Protection Standards”. Additionally, all Developers must follow all applicable NERC reliability standards. For protection systems in the Developer substation that do not meet the applicability of PJM Manual 7 (for example, protection systems protecting only equipment < 200kV), the PJM Relay Subcommittee has developed a PJM M7 exceptions document.