May 15, 2013

Members, Reliability Coordinating Committee
Messrs: Harvey J. Reed
        Edward A. Schwerdt

Re: Status Report of SP-7 Working Group on Protection System Misoperation Review

Ladies and Gentlemen:

The Task Force on System Protection at the March and May 2013 meeting reviewed the status of SP-7 Working Group on Protection System Misoperation Review as completed through the Fourth Quarter 2012. The chart below shows misoperations for the four quarters in 2012 as compared to those of 2011 using the seven NERC cause codes for protection misoperations.

The chart shows an overall reduction in the number of misoperations for the four quarters ending December 2012 as compared to the number of reported misoperations for 2011.
Note that the data collected was based on the requested reporting format, specifications, and template that apply to the BES which is generally 100 kV and above. Also, some members were not necessarily reporting misoperations for all facilities 100kV and above as they are currently not mandatory to do so.

The chart below further compares the number of misoperations in term of the relay technology for the two highest cause codes of Incorrect Setting/Logic/Design and Relay Failures/Malfunctions. The chart continues to show a large proportion of microprocessor-based relay misoperations are attributed of Incorrect Setting/Logic/Design Errors and Failure/Malfunctions.

![NPCC Misoperations Attributed to Incorrect Setting/Logic/Design Errors & Failures/Malfunctions in term of Relay Technology](image)

<table>
<thead>
<tr>
<th></th>
<th>Micro Processor Relay</th>
<th>Solid State Relay</th>
<th>Electromechanical Relay</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 Q1-Q4: Incorrect Setting/Logic/Design Errors</td>
<td>50</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>2012 Q1-Q4: Incorrect Setting/Logic/Design Errors</td>
<td>44</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>2011 Q1-Q4: Failures/Malfunctions</td>
<td>21</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>2012 Q1-Q4: Failures/Malfunctions</td>
<td>20</td>
<td>7</td>
<td>12</td>
</tr>
</tbody>
</table>

To tackle the large number of reported misoperations attributed to microprocessor relays, the SP-7 Working Group at the March 2013 meeting of the TFSP recommended the additional sub-cause codes below be incorporated into future NPCC misoperation reporting.
The Task Force accepted the SP-7 recommendation and requested that NPCC Staff incorporate into the recently updated misoperation reporting template to start collecting these additional information using these sub-cause codes on microprocessor relays starting with the reporting of protection system misoperations for the 2nd Quarter 2013. It is hoped that the additional details will provide NPCC with the information to further reduce the number of protection system misoperations in the future. These sub-cause codes will also be shared with the NERC System Protection and Control Subcommittee for their use.

SP-7 is currently reviewing the First Quarter 2013 misoperations data and will be reporting the data to NERC by July 15, 2013.

I will be available at the June 5, 2013 RCC meeting to review this report with you.

Sincerely,

Daren

Daren Verner, Chairman
Task Force on System Protection

cc: Members, SP-7 Working Group
    Members, Task Force on System Protection
    Mr. Philip Fedora - Assistant Vice President of Reliability Services