

DRAFT RECLAMATION MANUAL RELEASE

**Comments on this draft release must be submitted to Talmadge Oxford
(toxford@usbr.gov) by October 2, 2012.**

The FIST 3-23, “Instrument Transformer Secondary Grounding” is being retired because the information contained in the FIST has been updated and inserted into the new FIST 3-8. In accordance with Reclamation Manual procedures this FIST will be posted for a minimum of 30 days.

See the following pages for the FIST 3-23, “Instrument Transformer Secondary Grounding”.

DRAFT RECLAMATION MANUAL RELEASE
Comments on this draft release must be submitted to Talmadge Oxford
(toxford@usbr.gov) by October 2, 2012.

BUREAU OF RECLAMATION
FACILITIES INSTRUCTIONS, STANDARDS, & TECHNIQUES

Volume 3-23

INSTRUMENT TRANSFORMER
SECONDARY GROUNDING

DRAFT RECLAMATION MANUAL RELEASE
Comments on this draft release must be submitted to Talmadge Oxford
(toxford@usbr.gov) by October 2, 2012.

Instrument Transformer Secondary Grounding

ANSI C57.13.3 - Guide for the Grounding of Instrument Transformer Secondary Circuits and Cases, contains the following important grounding requirements:

1. The instrument transformer secondary circuit should be connected to the station ground at only one point. This holds true regardless of the number of instrument transformer secondary windings connected to the circuit. The reasons for grounding at a single point are as follows:

a. The flow of fault current through the ground mat can cause potential differences at different points in the ground mat. If the instrument transformer secondary circuit is grounded at more than one location, these potential differences can result in the flow of current through the relay, instrument, and meter coils resulting in instrument inaccuracies and possible relay misoperation. Also, high neutral conductor currents resulting from multiple ground connections can cause thermal damage to the neutral conductor.

b. The use of a single grounding point facilitates the temporary removal and re-establishment of the ground connection when desired in order to test for insulation deterioration or accidental grounds in the instrument transformer secondary circuit.

2. The point of grounding in the instrument transformer secondary circuit should be at the control

board or the first point of application. Grounding at the point of application, rather than at the transformer, is preferred for the following reasons:

a. Instrument transformers, their enclosures, and connections are more capable of withstanding the effects of voltage rise than control board components.

b. The increased use of sensitive solid-state devices in instrument transformer secondary circuits requires that voltage levels in the control boards be limited.

c. It provides the maximum protection for personnel at the point where they are most apt to be exposed to circuit overvoltages, the control board.

We are aware that instrument transformer secondary grounding is not in accordance with the above recommendations at some Reclamation facilities. In some cases the arrangement of the secondary windings or devices in the circuit makes it necessary to ground at some point other than the control board in order to obtain correct equipment performance; however, all other instrument transformer secondary circuits that do not conform with the recommended grounding practices should, when feasible, be modified to be in compliance. Please contact

D-8440, Denver, Office, if you need assistance in this process.