C37.62 – Fault Interrupters

April 24, 2017 – Charlotte, NC – Hilton University Place

Chair: Antone Bonner
Secretary: Karla Trost (on behalf of Frank DeCesaro)

Meeting Minutes

1. **Call to order and introduction:**

- Meeting was called to order at 10:16 AM.
  - Antone Bonner chaired and explained what this working group is about.
  - A new invitation to Ballot was sent out in the last week.
- Roster sheet was started and each person introduced themselves and identified their affiliation.

2. **Roster Check:**

- 38 Attendees, of which 18 are members. A quorum was present. Attendance is shown in Annex A.
- We had (12) new attendees.

3. **Previous Meeting Minutes:**

- Minutes are on the PES Switchgear Committee website.
  - One of the action items was for Anil Dhawan – to provide a definition for item 3.15. The copy of the draft that was available did not include item 3.15.
    - This item has been struck.
  - Nenad Uzelac made a motion to approve as amended. Francois Soulard seconded.

4. **Meeting Highlights:**

- Review of action items:
  - The definition shown is an IEC definition. Do we need permission to use? Antone Bonner reported that we do, but not until the final document.
  - Chris Ambrose – Does C37.62 need a clearing time definition (like C37.60)?
    - Antone reviewed the figure from C37.60 and compared it to the common dictionary definitions of the times shown in the figures. No objections to a revised figure being added to 37.62. Nenad suggested that the figure be called "Fault Interrupter Operation" to distinguish it from "Unit Operation" called out in C37.60.
  - Manufacturers were to provide suggestions for operational testing while the unit is submerged.
    - Kennedy Darko reviewed the G&W proposal.

      G&W would propose the following modifications to the submersible test procedure: If the submersible fault interrupter can be equipped with a submersible, remote, resettable device, the submersion test must include no load operations.

      1) The device must be tripped open and remotely reset no less than 25 times.

      2) The device's contact motion must be measured for each operation and must be within 20% of the pre-submersion values.

      Revise the following section: Device condition after Test to state:

      A device is considered to have passed the test if subsequent to the submersion test it passes the following routine tests:

a) *Dielectric test on the main circuit; one minute dry power-frequency*
b) *Measurement of the resistance of the main circuit*

- Francois reviewed information on 'endurance tests during immersion' from Hydro-Quebec's standards.
    - Discussion ensued about Chemical Composition of a liquid for submersion vs salt fog.
        - There is a lot of variation between utilities and what specific applications would require for the chemical composition.
        - It was noted that C37.74 does not include either requirement.
        - The potential corrosion of components/ operating is a significant issue that came up.
- Other comments on this topic:
    - From 37.74 and for the purpose of this standard – the equipment is not designed for continuous submersion. It was noted that the rubber goods will not support continuous submersion at the 3 meters that is called out in 37.74 and this draft of 37.62.
        - There are some applications where the gear is submerged for mostly continuous time periods.
    - Some form of operation test (while under submersion) is necessary.
    - Conversation over the selection of 3m of depth from the base of the unit. This came from C37.74 and was originally 10 feet before conversion to metric.
    - Comments to amend G&W's proposal:
        - Changing the number of operations to be performed across the duration of the test with time in between each operation. (Performed in equal number of operations across each day of the test, with a minimum of three per day.)
        - Discussion on the 20% value for contact motion.
            - Recommendation to utilize the vacuum bottle specifications.
            - Suggested to change the requirement to monitor the device's contact motion so that it must be within the tolerance defined by the manufacturer (same as the mechanical duty test list in D4/C37.62.)
            - **Action Item:** Antone Bonner to review the latest draft of 37.60 (6.109.2) for updated requirements to approve the condition of the device after test.
            - Does the inclusion of a travel monitor impact the sealing of the device?
                - Would a vacuum test be a better solution?
                - What about timing using the "trip input" and contact change of state? This could be compared before, during, and after the test.
        - Recommendation to include the Mechanical Duty Test at the end of the 'Device Condition After Test'.
            - One option would be to require the Mechanical Duty Test after the Submersion test (in the sequence of testing.)
            - C37.62 does not include a sequence of testing.
            - There may need to be two different test samples for the different types of test.

- Does there need to be a separate requirement to do a visual inspection for water ingress? Dielectric testing may not fully account for this.
- Is pre-conditioning allowed or we should define the voltage test values?
- **Action Item:** Kennedy Darko, Tim Royster, Anil Dhawan, and David Beseda to work together this week on revised verbiage.

Session II/III resumed at 1:40PM after the lunch break (18 Members present.)

- SSAO: Comparison of Overhead and Padmount
  - Antone reviewed the concept behind the SSAO test (from C37.60)
  - C37.62 is for single shot fault interrupters (vs reclosers) in overhead, padmount, and vault applications. Is the SSAO test still applicable? Should it be modified?
    - Nenad: There are a lot of factors including space between ground and conductors, length of cables, and geometry of the test set-up.
      - Geometry is different for padmount and vault. Nenad questioned the applicability.
  - Antone presented a comparison between applications
    - Overhead:
      - High surge current rate of rise
      - Surge arrestor protection
      - Control cable often parallels ground wire on pole.
    - Padmount/vault:
      - Lower surge current rate of rise (cable capacitance)
      - Surge arrestors often not used on bushings
      - Control cable does not parallel ground wires
  - Several utility members described how they use arrestors on padmounted equipment.
  - What about other surge tests?
    - C37.90.2 is still called out D4/C37.62.
    - There does not appear to be another standard / test that would be similar.
  - Discussion about control cable and ground cable running in parallel vs separate grounding points for padmount and vault applications.
  - This discussion is only pertinent if a surge arrestor is in use at the bushing.
  - Tim Royster made a motion – That the Simulated Surge Arrestor test requirements in the standard only be applicable to polemount applications where the control is located down the pole. (Seconded by Nenad)
    - Aye: 11
    - Nay: 0
    - Abstain: 7
  - **Action Item:** Asking for volunteers to review the technical aspect of this and bring a proposal in the fall? Antone Bonner, Nenad Uzelac.

5. New Business:

- Mark Feltis brought up that the Oscilliatory and fast transient surge test section (7.110.2) was updated in C37.60 due to the IEC updates. **Action Item:** Antone to review latest changes and implement in the draft as applicable.

6. Next meeting:

- Fall 2017 (9 Oct – 12 Oct), Portland, Maine

7. **Meeting was adjourned at 2:35 PM**

Submitted by:

Name: Antone Bonner
Date:

Annex: Member Attendance

Attendance at Fall 2016 Meeting of the WG for IEEE C37.62 (Fault Interrupters)

Role	First Name	Last Name	Company	City	State
Chair	Antone	Bonner	Eaton	South Milwaukee	WI
Guest		VonFeldt	Ameren	St. Louis	MO
Guest	Anil	Dhawan	ComEd	Oakbrook Terrace	IL
Guest	Brad	Lewis	American Electric Power		
Guest	Brendan	Kirkpatrick	Southern California Edison	Westminster	CA
Guest	Brian	O'Neil	CE power	Cincinnati	OH
Guest	Chris	Morton	Powertech Labs	Surrey British Columbia	
Guest	Christopher	Borck	Eaton's Cooper Power Systems	Franksville	WI
Guest	Emily	Goss	Hubbell Power Systems	Leeds	AL
Guest	Harold	Hirtz	Thomas and Betts	Solon	OH
Guest	Jason	Wright	Staubli	Windsor Canada	
Guest	Jean-Marc	Torres	Eaton	Horseheads	NY
Guest	Jeffrey	Door	H-J Family of Companies	High Ridge	MO
Guest	Jon	Spencer	Utility Solutions	Hickory	NC
Guest	Joseph	Kausek	First Energy Corporation	Akron	OH
Guest	Kennedy	Darko	G&W Electric Co	Bolingbrook	IL
Guest	Kevin	Rogerson	Eversource	Ellington	CT
Guest	Mark	Feltis	SEL	Pullman	WA
Guest	Mark	Patterson	H-J Family of Companies	St. Louis	MO
Guest	Paul	Barnhart	Underwriters Laboratories	Thomasville	NC
Guest	Peter	Glaesman	PCORE Electric Company, Inc.	Goldsboro	NC
Guest	Sterlin	Cochran	Hubbell Power Systems	Leeds	AL
Guest	Terrance	Woodyard	Siemens	Wendell	NC
Member	Chris	Ambrose	Federal Pacific (Div. of Electro-Mechanical Corp.)	Bristol	TN
Member	Chris	Lettow	S&C Electric Company	Buffalo Grove	IL
Member	David	Beseda	S&C Electric Co.	Chicago	IL
Member	Donald	Martin	G&W Electric Co.	New Lenox	IL
Member	Francois	Soulard	Hydro-Quebec	Montreal	QC
Member	Geoffrey	Reed	Thomas & Betts	Memphis	TN
Member	Herman	Bannink	KEMA Netherlands	Zelhem, Netherlands	
Member	Ian	Rokser	Eaton Corp	South Milwaukee	WI
Member	Jeffrey	Gieger	Thomas & Betts	Dingmans Ferry	PA
Member	Karla	Trost	G&W Electric	Bolingbrook	IL
Member	Nenad	Uzelac	G&W Electric Co	Bolingbrook	IL
Member	Steve	Meiners	GE	Cary	NC

Member	Timothy	Royster	Dominion Energy	Gum Spring	VA
Member	Tom	Stefanski	KEMA Powertest	Chalfont	PA
Member	Travis	Johnson	Xcel Energy	Denver	CO
Member	Wangpei	Li	Eaton	Horseheads	NY
Member	William	Ernst	Thomas & Betts	Hackettstown	NJ