

<b>POLICY:</b> <b>HIGH VOLTAGE POWER SYSTEM OPERATION</b>			<b>NUMBER:</b> WP-17
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<b>PREPARED BY:</b>  Facilities Management (FM)	<b>AUTHORIZED BY:</b>  <i>Lynn Logan</i> Lynn Logan	<b>CLASSIFICATION:</b>  Work Procedure	<b>EFFECTIVE:</b> July 1, 2015
			<b>SUPERSEDES:</b> September 1, 2004

**1. OPERATING PERSONNEL**

- 1.1 The operation and maintenance of all 4169 volt devices will be carried out by qualified electrical personnel.
- 1.2 The operation of all LIVE OPEN 27.6 kV switchgear shall be performed by qualified live line personnel and shall be accompanied by an operating bucket truck.
- 1.3 The operation of all DEAD FRONT 27.6 kV switchgear shall be performed by qualified electrical personnel.
- 1.4 There are to be a minimum of two qualified persons present for all switchgear operations

**2. DISTRIBUTION CIRCUITRY**

- 2.1 The system shall be operated as individual radial feeders.
- 2.2 Permanent paralleling of any feeders shall not be used.
- 2.3 Where short duration paralleling is used as a means of transferring loads, the following precautions shall be taken:
  - 2.3.1 Duration of parallel connection shall be kept to a minimum.
  - 2.3.2 Paralleling of Substations 226 (North), 234 (South) and 388 (East) is not to be done under any circumstances.
  - 2.3.3 One parallel connection only, at any one time, shall be permitted.
- 2.4 Control of all open switches shall be maintained by locking the switches open and retaining the padlock keys in a cabinet, as described under "6.0 Systems Records".

**3. OPERATING PROCEDURES**

- 3.1 All operations performed to achieve a new status of the system shall be under the direction of one person only, who shall be known as the "operation director". This person shall:
  - 3.1.1 Initiate or approve written scheduled operations.
  - 3.1.2 Personally direct each operating action performed.
  - 3.1.3 Record all such operations.
  - 3.1.4 The Operation Director is to remain at the operation centre until all switching procedures are complete

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<p>3.2 Scheduled operations of the system shall be by written instruction on a High Voltage Operation Sheet specifying the following:</p> <ul style="list-style-type: none"> <li>3.2.1 Date and time of operation.</li> <li>3.2.2 Listing of each operational action to be performed, in their correct sequence.</li> <li>3.2.3 The name of the operation director.</li> </ul> <p>3.3 All such operating instructions shall be checked and approved by a second person with the appointed operation director acting as either the initiator or the checker.</p> <p>3.4 Operations shall be carried out with the appointed <u>operation director remaining at the Service Centre (Support Services Building, Room 1315)</u>. They shall:</p> <ul style="list-style-type: none"> <li>3.4.1 Give clearances to perform each operation.</li> <li>3.4.2 Receive reports on operations performed.</li> <li>3.4.3 Record each operation.</li> </ul> <p>3.5 A person performing an operation as ordered by the operation director shall proceed as follows:</p> <ul style="list-style-type: none"> <li>3.5.1 Be personally satisfied that the operation is a safe one and that no danger to any worker exists.</li> <li>3.5.2 Confirm action with “operation director” with direct reference to a single line diagram in electrical room prior to and after each operation.</li> </ul> <p><b>4. <u>WORK PROCEDURES</u></b></p> <p>4.1 After receiving verbal confirmation that the system is dead from the director, the worker shall test each portion of the system with high voltage tester.</p> <p>4.2 The tradespersons shall ground and short together all portions of the systems that work, that are to be performed in, or that it is exposed to the workers. This grounding condition shall remain on during the complete duration of the work.</p> <p>4.3 Under no circumstances shall work be performed on <u>live high voltage</u> apparatus.</p> <p>4.4 A guarantee against accidental re-closing of switches, while work is in progress, will be achieved by the workers holding all keys providing control and isolation for the work site or area. Multiple padlock devices are to be used when equipment is locked out by more than one person (per WP-18 Lockout Tagout Policy). This includes contractors and other trades personnel.</p> <p>4.5 Only load break switches may be operated in an energized state. All other components, fuse cutouts, link boxes, shall be operated in a de-energized state.</p> <p>4.6 Under normal operating conditions all Kirk interlock keys will remain at their respective switches.</p>	

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<p>4.7 Verified and tested high voltage gloves, flash glasses, nonflammable, clothing shall be worn by all operators until the system involved has been grounded as per 4.2.</p> <p><b>5. IDENTIFICATION</b></p> <p>5.1 Each component of the high voltage system shall be identified by a code number. This identification shall be on the exterior face of the component with 2" high letters.</p> <p>5.2 The identification is to be updated before any new switch is taken over by UWO forces.</p> <p>5.3 A series of three numbers or letter groups separated by dashes shall be used.</p> <p>5.3.1 <u>Location of the Device</u></p> <p>A component associated with a location within a building will be identified by an abbreviation of the building's name. A component located outside a building and not associated with one will be identified with a number.</p> <p>5.3.2 <u>Device Number at the Location</u></p> <p>Each separate physical component at a location shall be individually identified.</p> <p>5.3.3 <u>Portion of a Device</u></p> <p>Each operable device within a single component shall be separately identified with an alphabetical letter.</p> <p><i>Example:</i></p> <table border="0"> <tr> <td>9 - 1 B</td> <td>Device #1</td> <td>Component B</td> </tr> <tr> <td>Manhole #9</td> <td></td> <td></td> </tr> <tr> <td>Syd #9</td> <td></td> <td></td> </tr> <tr> <td>Syd - 1 - A</td> <td></td> <td></td> </tr> <tr> <td>Sydenham Hall</td> <td></td> <td>Component A</td> </tr> </table> <p><b>6. SYSTEMS RECORDS</b></p> <p>6.1 A record shall be kept of all operations carried out in the system. It shall be the responsibility of the operation director to enter the following information immediately after each operation.</p> <p>6.1.1 Purpose of the operation</p> <p>6.1.2 Date of the operation</p> <p>6.1.3 Details of each specific operation performed, together with the time it was done.</p> <p><b>7. FEEDER STATUS CHART</b></p> <p>7.1 A single line schematic diagram of the system shall be maintained to indicate the status of the system. Each feeder shall be separately identified throughout its entire length on the drawing to indicate the buildings and cable which are connected to a sub-station feeder. All devices in the open position shall be marked. All unmarked are to be assumed to be closed.</p>		9 - 1 B	Device #1	Component B	Manhole #9			Syd #9			Syd - 1 - A			Sydenham Hall		Component A
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<p>7.2 A separate cabinet shall be used to hold the following:</p> <ul style="list-style-type: none"> <li>7.2.1 Links which have been removed from the link boxes.</li> <li>7.2.2 Keys for padlocks on switches which are locked open.</li> <li>7.2.3 Padlock and keys for all switches that are closed.</li> </ul> <p><b>8. <u>HIGH VOLTAGE POTENTIAL TESTERS</u></b></p> <p>8.1 Test equipment will be checked before and after test to ensure it was operational during the test.</p> <p><b>9. <u>PHASE ROTATION TEST AND PHASE ALIGNMENT TEST</u></b></p> <p>9.1 All live testing shall be done in accordance with operating procedures described in item 3.</p> <p>9.2 Testing shall be performed with three people. Two people shall do the testing, dressed as described in 4.7. The third shall act as the Director of the test and the safety person. They are to be fully familiar with how to de-energize all live circuits tested. They shall be in direct communication with the Operation Director.</p> <p>9.3 Prior to and after each phase rotation test:</p> <ul style="list-style-type: none"> <li>9.3.1 Both test sticks are to be touched to the ground bus. Volt metre is to measure 0.</li> <li>9.3.2 Both test sticks are to be touched to the same live phase. Volt metre is read 0.</li> <li>9.3.3 Test each phase for the presence of line voltage, with one test stick.</li> </ul> <p><b><u>DEFINITIONS PERTINENT TO THIS POLICY</u></b></p> <p><b><u>Qualified:</u></b></p> <p>A licensed electrician in the Province of Ontario, with additional high voltage training for the particular work being done and is authorized to the work required.</p> <p><b><u>Authorized:</u></b></p> <p>A person has received written instructions from the Director of Facilities Management to do specific work.</p>	