Internal Controls for Generator Owners/Operators

North American Generators Forum
Annual Meeting
October 16, 2019

Ben Eng/NPCC
Manager, Entity Risk Assessment
'Assuring BES Reliability through Risk and Controls Management'
Objectives

• Risk Based Compliance Monitoring
• Why do we need controls?
• Primer on controls  
  • Types  
  • Modality  
  • Control design components (control silos)  
  • Effectiveness/Examples  
  • Attributes of Better Controls  
• Illustrative personal example to understand the above.
• Illustrative examples of NERC Reliability Standards applicable to GO/GOP registered functions.
• “Testing” of controls
RBCMEP (Risk Based Compliance Monitoring)

- Who remembers the AML?
- Effective 2015, the ERO entered the RBCMEP era
Compliance with NERC Reliability Standards

• All Registered Entities are responsible for Compliance to applicable NERC Reliability Standards.

• Entity internal controls have become an increasingly important aspect of an organization’s governance, management and operations to manage risks and counter threats to achieving business objectives.

• To benefit from the narrower focus (but deeper dive) of Risk Based Compliance Monitoring, an understanding of the entity’s controls in place to mitigate risks is required.

• Passing an audit, spot check or self-certification doesn’t necessarily mean you make the BES more Reliable or Resilient
CONTROLS - What are they?

a) Procedures, Policies, Guides, Practices, Instructions, Studies
b) Spreadsheets, Databases, Lists, Passwords, Patches, Barriers, Work Management, Reminders
c) Staff, contractors; trained to do their jobs; certified if necessary
d) All of the above
CONTROLS - Why do we have controls?

a) Because I’m a “Control Freak” and I like to be in charge.
b) Because if I don’t have them, I’ll be found non-Compliant during a NERC Audit, Spot Check or Self Certification.
c) Because it’s in vogue to have them. Everyone else says they have them and I don’t want to be the odd person that doesn’t.
d) Because fully implemented controls (tested and monitored) help ensure consistent, rigorous achievement of goals in a timely manner. Controls are used to mitigate Risks.
e) All of the above
RISKS – What are they?

a) a situation involving exposure to danger.

b) the possibility of losing something of value (such as physical health, social status, emotional well-being, or financial wealth) resulting from a given action or inaction, planned or unplanned).

c) Vary depending on your “environment”: Health, Safety, Financial, Career, Education, Travel, Weather, City/Rural, Gender, Religion, Politics....

d) Can be mitigated to an acceptable level by use of controls

e) All of the above
Primer on Controls

• Types
• Modality
• Control design components
• Effectiveness/Examples
• Attributes of Better Controls
Types of Controls

- Preventative [P] controls in place to
  - Reduce risks
  - Achieve goals
  - Pass audit
  - Exceed the requirement and improve reliability

- Detective [D] controls to monitor/detect degraded ability to reduce risk or identify drift from achieving goals

- Corrective [C] controls to fix or mitigate the consequences of the risks incurred or adjust the drift from achieving one’s goals

- Real time and forward looking
Modality of Controls

How a control is set or used (subject to interpretation)

• Manual/Passive
  • Signs
  • Procedures
  • Attendance Sheets/Login Sheets
  • Checklists
  • Train conductor, Ticket Booth attendant, Meter Person

• Automatic (100% or predominantly “Set and Forget”)
  • Security Cameras, Intrusion Detection
  • Thermostat (Heating or AC)
  • EzPass unit/Toll Detector
  • Relay Setting; Circuit Breakers; GFCI
  • SCADA/EMS/Control Panel settings and alarms
  • Sump Pump
  • Robocalls

• Semi-Automatic (involves more interaction with human “tool”)
  • Self-check cash registers
  • Vehicle lane assist driving; Google Maps; WAZE
  • Phone Apps, Home Apps – texting, Siri, Phone/Contact List; Alexa, Echo, Dot
Internal Control Designs generally consist of a combination of the three “Control Silos” shown below:

- Document the control silos that help you achieve your objective
- Identify Key Controls
- Identify type and modality of control - Preventative, Detective and/or Corrective
- Document implementation and testing of key controls to confirm their effectiveness.
- Apply primary path to achieving overall objective. Develop alternate path/controls to achieve overall objective.
Types of Controls - Preventative

- Procedures
- Signage
- Training
- Monitoring/Situational Awareness
- Limit Access

All of the above are meant to keep the bad thing from happening ("preventative" controls)
Types of Controls - Detective

- Preventative controls are not 100% effective
- May be bypassed, ignored, degrade over time
- Monitor the effectiveness of preventative controls (using “detective” controls).
Types of Controls - Corrective

- Detective controls inform us of abnormal conditions ("drift from compliance" or "non-compliance")
- **Corrective** controls are applied to mitigate the risks from the abnormal condition
- Corrective controls must be reliable and complete
Control Design – Layering/Defense in Depth

Preventative Controls = Best
(Procedures, signage, training, monitoring/situational awareness, limit access)

Detective Controls = Better

Corrective Controls = Good
Pizza-thieving Connecticut dog starts stove-top kitchen fire

Published in Cats & Dogs News


“Even effectively designed and implemented internal controls cannot provide absolute assurance of compliance...”
Preventative Controls – How Effective are They?
Preventative Controls – Effectiveness?
Preventative Controls – Effectiveness?
Preventative Controls – Effectiveness?

- Preventive Controls: Effectiveness?
Controls – Degrade over time

Public clocks in Lower Hudson Valley are wrong more than half the time
Preventative Controls – Special skills needed?

It's a good thing I'm bi-lingual
Testing Controls – Do you need to test these?
Is this an effective control?
How would you determine its effectiveness?
How would you improve it?
Personal Example

• Elderly mother-in-law. Doesn’t speak or read English. Homebound
• Visiting Home Aide. Doesn’t speak or read English. Daily visits
• Visiting Nurse speaks English and Chinese.
  • Visits every other month to see patient and review prescription drugs
  • Does spot checks of medication in pill boxes. Frequently after release from hospital.
• Doctors examine her on a regular basis and prescribe/adjust meds.
• Subject to compliance with Medical Standard MED-001 requirement R1
  R1. Prescription Medication must be available to the patient for 1 week. Must include the following considerations:
  R1.1. Proper Medication and Dosage
  R1.2. Proper Day and Time to Consume
  R1.3. Taken with or without food
  R1.4. Exceptions and Special Conditions
Control Design for Personal Example

Functional Process Flow Diagram
Mother-In-Law’s Meds

Ben’s “Life Plan”

Career
- Work
- Achievements
- Salary
- Paid Time Off
- Benefits

Leisure
- Bucket List
- Recreational
- Dining

Health
- Exercise
- Nutrition
- Dental
- Medical History
- Preventative Actions
- Corrective Actions
- Emotional Support Animal

Shopping
- Groceries
- Luxuries
- Holidays

Finances
- Savings
- Investments
- Retirement
- Pension
- Medicare
- Social Security

Ben’s Weekend Tasks:
1. Lunch with Mom (D1)
2. Meds for Mother-In-Law (D4)
3. Grocery Shopping (D1, D2, D3)
4. Other Shopping (D1, D2, D3)
5. Sightseeing (D1, D2, D3)
6. Other Events
7. Other Dining
8. Laundry

Travel To Chinatown
Fix Mom’s Meds

Other Qualified “Personnel”
P4, P5

Travel Home
Place Meds where Home Visiting Aide can administer daily

Mom’s Meds for 1 Week Completed

D1-D10 (as applicable): T1-T6 (as applicable): P1 P2

Documents
- D1: Travel to Crown
- D2: Travel to Westchester, Putnam, Connecticut
- D3: Travel to NJ
- D4: Process for Weekly Pills

Tools
- D5: Prescription List
- D6: Drivers License
- D7: Insurance Card
- D8: Inspection Sticker
- D9: Registration
- D10: License Plate

People
- P1: Ben Eng
- P2: Ben’s Wife
- P3: Visiting Aide
- P4: Son
- P5: Daughter

Standards and Requirements
Med-001 R1 – Prescription Medication must be available to the patient for one week.
- R1.1. Proper Medication and dosage
- R1.2. Proper time and day to consume
- R1.3. Taken with/without Food
- R1.4. Exception/Special Conditions
Mom-in-law’s Meds

**RISK** to be mitigated via proper control design

- Decline in patient health due to improper administration of prescription medicine
- Decline in patient health due to patient “self-medication” (refusal to take medication without informing doctor).
**Pre-Med Controls**

**Key Controls**
- Latest list of prescription medication.
- Trays of empty pill boxes
- Bag of prescription medication (current and spare)
- Special knotting to detect tampering

**Other Controls (may be key to implementing the above)**
- Access to Mom-in-law’s apartment
- Transportation to Mom-in-law’s apartment
- Able to read English, follow directions, use tools
- Communicate with Mom-in-law and Visiting Aide
Meds – Tools and Change Management

Intro and Background

11/5/2019

Meds

Tools and Change Management

Every day she takes the pills listed below. Each day’s pill container has 4 compartments. Compartment 1 & 2 have about ten (10) pills to be taken in the daytime. They are divided into 2 compartments to avoid omitting one compartment. Compartment 4 is for dinner.

March 2018: As result of mom’s release from the hospital (for pneumonia and flu), she was advised to stop pills #2 and #7. Her blood pressure was extremely low in the hospital and post-release. Also the anti-coagulating meds were postponed for recovery from Late June 2018: Cardiologist advised Bus and Gli to reduce Pill #13 from daily to 2x per week. Also added Vitamin D (pill #9) and increased dosage of 8-12 from 100mcg to 200mcg.

Compartment 1 (top)
1. Folic Acid 1mg
2. Calcium 250mg
3. Metoprolol Tartrate 25mg
4. Carbidopa Levodopa (25-100mg) split
5. Hydrochlorothiazide 12.5mg
6. Vitamin D

Compartment 2
7. Amlodipine 5mg
8. B-12 500mcg
9. Carbidopa Levodopa 12.5-50mg

Compartment 3
10. Omega 3
11. Omeprazole 20mg
12. Atorvastatin 10mg
13. Metoprolol Tartrate 25mg

Compartment 4
- All pills are compartment taken in daytime.
- All pills are compartment taken in daytime.
- High blood pressure, chest pain from poor blood flow to heart.
- Manage symptoms of Parkinson’s disease.
- Over the counter:
- As of June 2018
- As of September 2017
- As of August 2016
- Reduced stomach acid (Prevents)
- Cholesterol (Lipid): Take 2x per week, not daily
- Same pill as #3, taken 2x per day

Use splitter.

Resume in Sept 2017 (for blood sugar).
Resume at August 2016.
High blood pressure — consider hypotensive agents.
Reduces stomach acid (Prevents)
Cholesterol (Lipid): Take 2x per week, not daily
Same pill as #3, taken 2x per day

For Praxil

Use splitter.

Use splitter.

Use splitter.

Use splitter.

Use splitter.

Use splitter.
Med Closeout

Key Controls
• Do a visual self-check (count number of pills in each compartment for each day) to confirm proper admin of meds
• Place completed medication pill boxes where Visiting Aide can find and administer
• Instruct Aide to refill any medication as needed
• Secure bag of prescription medication
  o Special knotting to detect tampering

Other Controls (may be key to implementing the above)
• **Controls enhancement:**
  Prepare 3 weeks worth of medication as contingency for inability to come to Chinatown for 2 weekends.
Ben is an “internal control tool”

We are ALL “internal control tools”. *Skilled Human Capital* is one of the 3 Control Silos. Procedures, signs, rules are all created by, and written for us.

As “skilled human capital” we rely on tools to minimize risks and achieve goals (celebrate little victories)

- One of those tools are Mnemonics.

- “Funky Wall Glass” is what I use when leaving the house or office
  - **Good news**: Effective when used – works for me
  - **Bad news**: I’m in a hurry or get distracted and don’t use it. End up wasting time going back to get it.
Illustrative Example of NERC Standards for GO/GOP

1. Title: Protection System Misoperation Identification and Correction
2. Number: PRC-004-5(i)
3. Purpose: Identify and correct the causes of Misoperations of Protection Systems for Bulk Electric System (BES) Elements.
4. Applicability:
   4.1. Functional Entities:
   4.1.1 Transmission Owner
   4.1.2 Generator Owner
   4.1.3 Distribution Provider
R1. Each Transmission Owner, Generator Owner, and Distribution Provider that owns a BES interrupting device that operated under the circumstances in Parts 1.1 through 1.3 shall, within 120 calendar days of the BES interrupting device operation, identify whether its Protection System component(s) caused a Misoperation: [Violation Risk Factor: High][Time Horizon: Operations Assessment, Operations Planning]

1.1 The BES interrupting device operation was caused by a Protection System or by manual intervention in response to a Protection System failure to operate; and

1.2 The BES interrupting device owner owns all or part of the Composite Protection System; and

1.3 The BES interrupting device owner identified that its Protection System component(s) caused the BES interrupting device(s) operation or was caused by manual intervention in response to its Protection System failure to operate.
• Excellent Generator Owner (EGO) has a pristine record of operation. It has operated continuously for 6 years without interruption. No Protection System Operations. Therefore, nothing to analyze and determine if it is a Misoperation.
• Audit of R1 = No Finding during the Audit Period (6yrs until now)
• Same result for R2 through R6 = No Finding
• Are we done? Go out for drinks and celebrate? Not so fast…. 
• Compliance with the requirement does not necessarily mean you have good controls for them – EOP-004, PRC-004, VAR-002, COM-002

• Each of the above may result in an audit finding of “No Finding” if there was no qualifying event requiring actions.

• But “WHAT IF...” a qualifying event were to happen right now? Your controls are in place to mitigate the risks to reliability for the above. (Forward looking)

• Documented controls and effectiveness testing/monitoring benefits:
  • Understanding of Key Reliability Functions
  • Training/Succession Planning
  • Resilience
  • Progress toward High Reliability Organization
PRO-004 – “What IF…..”

• What if 5 minutes after the audit has ended, Excellent Generator Owner (EGO) experienced its first PSO in history? (or what if it happened right now as you listen to me drone on about controls…)
  • Would you know it happened? How would you know?
  • Would you know what to do? Does someone else know what to do? Does everyone who needs to know what to do, “know what to do”?
  • Will required actions be taken in a timely manner? What is “timely”?
  • Are there “tools” available to responsible individuals to perform the proper actions in a timely manner?
  • Do you need to self-report?

• The answers to all of the above are found in your internal controls
M1. Each Transmission Owner, Generator Owner, and Distribution Provider shall have dated evidence that demonstrates it identified the Misoperation of its Protection System component(s), if any, that meet the circumstances in Requirement R1, Parts 1.1, 1.2, and 1.3 within the allotted time period. Acceptable evidence for Requirement R1, including Parts 1.1, 1.2, and 1.3 may include, but is not limited to the following dated documentation (electronic or hardcopy format): reports, databases, spreadsheets, emails, facsimiles, lists, logs, records, declarations, analyses of sequence of events, relay targets, Disturbance Monitoring Equipment (DME) records, test results, or transmittals.

• Some hints provided for what the controls should address
• Dated evidence; within allotted time period,
• Grocery list of examples of “dated documentation”
PRC-004 example Process Flow Diagram
Did you know that PRC-004 has a process flow diagram on the penultimate page of its Application Guide?

This is a template for developing controls to meet the objective of Requirement R1

What it doesn’t describe are some specifics (Entry Point)
PRC-004 – If the PSO is a Misop...

- The preceding process flow diagram for R1 leads you to other applicable requirements depending on the answers to the decision boxes: R4, R5
- Again, this is a template for developing controls to meet the objectives of the other requirements.
- These help answer “What needs to be done, using what tools; when and by whom?” “Are the actions/results consistent, complete, and repeatable?”
- How do you know your controls are working? Do you test them?
Diagram annotates:

1. Control silos to the Legend using letters, numbers (balloons):
   - Procedures, governing Docs
   - Tools
   - Skilled Human Capital

2. Box(es) showing where the specific requirement is met.
   - The process flow diagram should be annotated/tagged to the legend. Together they should answer the "who, what, when, where, why, how" the internal control is implemented to meet compliance.
VAR-002

1. Title: Generator Operation for Maintaining Network Voltage Schedules

2. Number: VAR-002-4.1

3. Purpose: To ensure generators provide reactive support and voltage control, within generating Facility capabilities, in order to protect equipment and maintain reliable operation of the Interconnection.

4. Applicability:
   4.1. Generator Operator
   4.2. Generator Owner
R1. The Generator Operator shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode (with its automatic voltage regulator (AVR) in service and controlling voltage) or in a different control mode as instructed by the Transmission Operator unless: 1) the generator is exempted by the Transmission Operator, or 2) the Generator Operator has notified the Transmission Operator of one of the following: [Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]

- That the generator is being operated in start-up,\(^1\) shutdown,\(^2\) or testing mode pursuant to a Real-time communication or a procedure that was previously provided to the Transmission Operator; or
- That the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, shutdown, or testing.
R1. The Generator Operator shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode (with its automatic voltage regulator (AVR) in service and controlling voltage) or in a different control mode as instructed by the Transmission Operator unless: 1) the generator is exempted by the Transmission Operator, or 2) the Generator Operator has notified the Transmission Operator of one of the following:

[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]

- That the generator is being operated in start-up,\(^1\) shutdown,\(^2\) or testing mode pursuant to a Real-time communication or a procedure that was previously provided to the Transmission Operator; or
- That the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, shutdown, or testing.
Generator Operator for the Excellent Generator Owner (EGO) has always operated in *automatic voltage control mode* (AVR in service and controlling voltage) since EGO’s generator was commissioned 6 years ago. It has operated continuously for 6+ years without change in mode. None of the triggers or exceptions stated in R1 were ever encountered.

- Audit of R1 = No Finding during the Audit Period (6yrs until now)
- Same result for R3 = No Finding
- Are we done? Go out for drinks and celebrate? Not so fast….
VAR-002 – “What IF…..”

• What if 5 minutes after the audit has ended, Generator Operator for Excellent Generator Owner (EGO) had to take the AVR out of voltage control mode for the first time in its operating history? (or what if it happened right now as you listen to me drone on)
  • Would you know it happened? How would you know?
  • Would you know what to do? Does someone else know what to do?
  • Will required actions be taken in a timely manner? Define timely?
  • Are there “tools” available to responsible individuals to perform the proper actions in a timely manner?
  • Do you need to self-report?

• The answers to all of the above are found in your internal controls
VAR-002 – Controls (partial answer)

M1. The Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it failed to operate a generator in the automatic voltage control mode or in a different control mode as specified in Requirement R1. If a generator is being started up or shut down with the automatic voltage control off, or is being tested, and no notification of the AVR status is made to the Transmission Operator, the Generator Operator will have evidence that it notified the Transmission Operator of its procedure for placing the unit into automatic voltage control mode as required in Requirement R1. Such evidence may include, but is not limited to, dated evidence of transmittal of the procedure such as an electronic message or a transmittal letter with the procedure included or attached. If a generator is exempted, the Generator Operator shall also have evidence that the generator is exempted from being in automatic voltage control mode (with its AVR in service and controlling voltage).

• Some hints provided for what the controls should address
• Create a table of conditions, exemptions, GOP actions and notification status to TOP.
• examples of types of evidence (light green)
### VAR-002-4.1 — Generator Operation for Maintaining Network Voltage Schedules

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R3.</strong></td>
<td>Each Generator Operator shall notify its associated Transmission Operator of a status change on the AVR, power system stabilizer, or alternative voltage controlling device within 30 minutes of the change. If the status has been restored within 30 minutes of such change, then the Generator Operator is not required to notify the Transmission Operator of the status change. [Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]</td>
</tr>
<tr>
<td><strong>M3.</strong></td>
<td>The Generator Operator shall have evidence it notified its associated Transmission Operator within 30 minutes of any status change identified in Requirement R3. If the status has been restored within the first 30 minutes, no notification is necessary.</td>
</tr>
</tbody>
</table>

- Controls help answer “What IF…” the AVR has not been restored to voltage control mode? Would you know you’re approaching 30 minutes? Would you know what to do if you exceed the 30 minute mark? Will qualified personnel be consistent in their actions/reactions?

- Consider a timer or annunciator to monitor status of AVR and/or warn of impending deadline to notify TOP. Provide TOP with real-time AVR status.
EOP-004-4 – Event Reporting

A. Introduction

1. Title: Event Reporting
2. Number: EOP-004-4
3. Purpose: To improve the reliability of the Bulk Electric System by requiring the reporting of events by Responsible Entities.
4. Applicability:

4.1. Functional Entities: For the purpose of the Requirements and the EOP-004 Attachment 1 contained herein, the following Functional Entities will be collectively referred to as “Responsible Entity.”

4.1.1. Reliability Coordinator
4.1.2. Balancing Authority
4.1.3. Transmission Owner
4.1.4. Transmission Operator
4.1.5. Generator Owner
4.1.6. Generator Operator
4.1.7. Distribution Provider
Each Responsible Entity shall report events specified in EOP-004-4 Attachment 1 to the entities specified per their event reporting Operating Plan by the later of 24 hours of recognition of meeting an event type threshold for reporting or by the end of the Responsible Entity’s next business day (4 p.m. local time will be considered the end of the business day). [Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]
EOP-004 - Audit

• In all its years of operation, Excellent Generator Owner (EGO) has never experienced any damage, destruction, physical threats or suspicious activity to its facilities.

• Audit of R2 = No Finding during the Audit Period (6yrs until now)

• GREAT!!! Passed every audit, spot check and Self Cert with No Finding. Never had a qualifying event to report.

• Are we done? Go out for drinks and celebrate? Not so fast…. 
EOP-004 – “What IF…..”

• What if 5 minutes after the audit has ended, you had a qualifying event (actual attack on your assets – substation)? (or what if it happened right now as you listen to me drone on)
  • Would you know it happened? How would you know?
  • Would you know what to do? Does someone else know what to do?
  • **Aside from actions to respond to the damage/destruction/attack on your facility, are you aware of Event Reporting obligations?**
    • Do you know WHO to report to, and WHEN, and how often?
    • Are there “tools” available to responsible individuals to perform the proper actions in a timely manner?
• The answers to all of the above are found in your internal controls
EOP-004 – Controls (partial answer)

M2. Each Responsible Entity will have as evidence of reporting an event to the entities specified per their event reporting Operating Plan either a copy of the completed EOP-004-4 Attachment 2 form or a DOE-OE-417 form; and some evidence of submittal (e.g., operator log or other operating documentation, voice recording, electronic mail message, or confirmation of facsimile) demonstrating that the event report was submitted by the later of 24 hours of recognition of meeting an event type threshold for reporting or by the end of the Responsible Entity’s next business day (4 p.m. local time will be considered the end of the business day).

- Some hints provided for what the controls should address
- Tools: DOE-OE-417 form and instructions
- Examples of types of evidence (light green)
- Timing obligations for submittals (cyan)
OE-417 Form and Instructions:

- **Generating Entities** - Entities who have 300 MW or more of generation dedicated to one or more end-use customers (e.g., retail or industrial customers) are required to file the form under criterion number 5.

- **Local Utilities** in Alaska, Hawaii, Puerto Rico, the U.S. Virgin Islands, and the U.S. Territories - If the local electrical system is less than 300 MW, then only file if criteria 1, 2, 3, or 4 are met.

• Reporting Criterion 1 through 5 shown on next page
**Criteria for Filing:**

**EMERGENCY ALERT: Within One Hour of Incident:** Schedule 1 and lines M - Q of Schedule 2 must be filed if one or more of the following criteria are met:

1. **Physical attack** that causes major interruptions or impacts to critical infrastructure facilities or to operations.
2. **Cyber event** that causes interruptions of electrical system operations.
3. **Complete operational failure** or shut-down of the transmission and/or distribution electrical system.
4. **Electrical System Separation (Islanding)** where part or parts of a power grid remain(s) operational in an otherwise blacked out area or within the partial failure of an integrated electrical system.
5. **Uncontrolled loss** of 300 Megawatts or more of firm system loads for more than 15 minutes or more from a single incident.
<table>
<thead>
<tr>
<th>Criteria for Filing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMERGENCY ALERT</strong> File within 1 Hour</td>
</tr>
<tr>
<td>If any box 1-8 on the right is checked, this form must be filed within 1 hour of the incident; check Emergency Alert (for the Alert Status) on <strong>Line A</strong> below.</td>
</tr>
<tr>
<td>☐ 1. Physical attack that causes major interruptions or impacts to critical infrastructure or to operations</td>
</tr>
<tr>
<td>☐ 2. Cyber event that causes interruptions of electrical system operations</td>
</tr>
<tr>
<td>☐ 3. Complete operational failure or shut-down of the transmission and/or distribution of electrical system</td>
</tr>
<tr>
<td>☐ 4. Electrical System Separation (Islanding) where part or parts of power grid remain(s) operational in an otherwise blocked out area or within the partial failure of an integrated electrical system</td>
</tr>
<tr>
<td>☐ 5. Uncontrolled loss of 300 Megawatts or more of firm system loads for 15 minutes or more from a single incident</td>
</tr>
<tr>
<td>☐ 6. Firm load shedding of 100 Megawatts or more implemented under emergency operational policy</td>
</tr>
<tr>
<td>☐ 7. System-wide voltage reductions of 3 percent of more</td>
</tr>
<tr>
<td>☐ 8. Public appeal to reduce the use of electricity for purposes of maintaining the continuity of the Bulk Electric System</td>
</tr>
</tbody>
</table>

| **NORMAL REPORT** File within 6 Hours |
| If any box 9-12 on the right is checked AND none of the boxes 1-8 are checked, this form must be filed within 6 hours of the incident; check Normal Report (for the Alert Status) on **Line A** below. |
| ☐ 9. Physical attack that could potentially impact electric power system adequacy or reliability; or vandalism which targets components of any security systems |
| ☐ 10. Cyber event that could potentially impact electric power system adequacy or reliability |
| ☐ 11. Loss of electric service to more than 50,000 customers for 1 hour or more |
| ☐ 12. Fuel supply emergencies that could impact electric power system adequacy or reliability |
**WHEN TO SUBMIT**

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Time Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit Emergency Alert - Schedule 1 and lines M - Q of Schedule 2</td>
<td>Within 1 hour after the incident if any of criteria 1-8 is met.</td>
</tr>
<tr>
<td>Submit Normal Report - Schedule 1 and lines M –Q of Schedule 2</td>
<td>Within 6 hours after the incident if any of criteria 9-12 is met and criteria 1-8 has not been met.</td>
</tr>
<tr>
<td>Submit System Report - Schedule 1 and lines M –Q of Schedule 2</td>
<td>By the later of 24 hours after the recognition of the incident OR by the end of the next business day if any of criteria 13-24 is met. Note: 4:00pm local time will be considered the end of the business day.</td>
</tr>
<tr>
<td>Submit Update - Schedule 1 and lines M - Q of Schedule 2</td>
<td>As applicable after initial submission if significant new information is available or if significant changes occurred since submission.</td>
</tr>
<tr>
<td>Submit Final - Schedule 1 and Schedule 2</td>
<td>Within 72 hours after incident.</td>
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Controls Questions and Testing

• What procedure(s) are used to meet compliance?
  • Are the procedures current? How do you know the steps, results, deliverables in the procedure have been performed in a timely manner?
  • What (“testing”) evidence can you provide to confirm the above? Looking for Emails, work management task status/closeout, meeting minutes, checklists, lessons learned, logs, setpoints/calculations, attendance for drills/meetings, metrics/reports.

• What tools are used to meet compliance?
  • How do you know the tools are working properly?
  • Do you have evidence that the tool has been used when required?
  • What “testing” evidence can you provide?

• Who is applying the tools and implementing the procedures listed above?
  • Are the people using the tools and applying the procedure qualified, trained, authorized?
  • If that person leaves, is there a backup?
  • What (“testing”) evidence can you provide (quals, training records, drills, simulators)
Attributes of Better Internal Controls

- **Layering**
  - Augment Preventative controls with Detective controls and Corrective controls
  - Test/Monitor the effectiveness of Key Controls

- **Repeatable results**
  - Tools - Automated tools generally provide consistent results.
  - Automation is less subject to distraction, fatigue, complacency, juggling multiple tasks.
  - SCADA, EMS, Work Management, Software (Databases, Queries, Reports, Outlook)

- **Monitoring/Early warning**
  - Periodic or Real Time monitoring/status of planned work.
  - Timers, reminders and alarms of required or desired actions.
  - Reminders in advance of deadline. Frequency of testing/monitoring > required by NERC (e.g. protective device testing). Provides “margin” to meet compliance and avoid need to Self Report.

- **Feedback/Closure**
  - Process to ensure completion of work before approving closeout of work package/ticket/report
  - Maintain records (e.g. maintenance/test records) supporting the closeout of work tickets. Shift turnover checklists. Training records and feedback. Drills and participants and lessons learned.
We all have internal controls.
We may not recognize them as such.
We take internal controls for granted.
They are there for a reason - to minimize risks.
We use (or don’t use) internal controls to different degrees.
Internal controls increase our chances of success in achieving a goal.
Internal controls vary in effectiveness and may need support through “layering”.
One thing is certain – a control is 0% effective if you don’t use it.
Questions?

THANK YOU !!!

beng@npcc.org