Reliability Guideline:
System Operator Verbal Communications – Current Industry Practices

Preamble

It is in the public interest for NERC to develop guidelines that are useful for maintaining or enhancing the reliability of the Bulk Electric System (BES). Reliability Guidelines provide suggested guidance on a particular topic for use by BES users, owners, and operators according to each entity's circumstances. Reliability Guidelines are not to be used to provide binding norms, establish mandatory reliability standards, or create parameters by which compliance to standards is monitored or enforced.

Introduction

This Reliability Guideline is available to electricity sector organizations responsible for the operation of the BES. It provides general concepts that may be considered when developing a system operator verbal communications program. This guideline provides a general framework for identifying the concepts and steps to consider for an effective system operator verbal communications program. This document, written in the form of a guideline, is a collection of industry practices compiled by the NERC Operating Committee (OC). The use of these methodologies and guidelines is strictly voluntary. Entities should consider goals of going beyond the standards to facilitate a higher level of reliable operations without the expectation of having to be perfect in meeting the goals for compliance purposes. As BES communications practices, procedures and technologies change, electric entities are encouraged to implement such changes as appropriate.

Purpose

The purpose of this guideline is to document and share current verbal BES communications practices and procedures from across the industry that have been found to enhance the effectiveness of system operator communications programs. These are not mapped to existing or future mandatory requirements, but rather are intended to show the breadth of industry practices concerning verbal communications.

Guideline Details

Components of an effective system operator verbal communications program may include:

I. Verbal Communications Tools

System operators use a variety of tools for communicating information with other system operators. The tool used for communicating specific information with various recipients depends on a number of factors, such as the urgency, importance, and intended impact of the information being communicated. The urgency, importance, and impact of the specific information are highly dependent on the role and responsibility of each party to the communication. As an example, email may be the

appropriate tool if the information exchange is not urgent, while a one-on-one phone call may be the best method to communicate both urgent and important information. Also, in some cases multiple tools may be used to communicate the same information to different parties.

Tools used for system operator communications and some typical applications for those tools are as follows:

1. Voice Communications

    a. Public Switched Telephone Network (PSTN) – This is the most common communication tool for system operators to use to communicate with other system operators and field personnel. It is highly reliable and secure. Application examples include:

        i. Dedicated conference call arrangements

        ii. Dedicated circuits between facilities

        iii. Multi-party initiated calls

        iv. Speed dial functionality

    b. Private Internal Telecommunications Systems – Some utilities have found economies of scale by installing their own communications network utilizing microwave and/or fiber optic telecommunications networks. These networks perform the same function as the PSTN discussed above.

    c. Voice Over Internet Protocol (VOIP) – The communication protocols, technologies, methodologies, and transmission techniques involved in the delivery of voice communications and multimedia sessions over Internet Protocol (IP) networks, such as the Internet, rather than the public switched telephone network (PSTN).

    d. Cell phones – These are widely used by field personnel to contact system operators. They are reliable in urban and suburban settings but are less reliable in remote areas. Cell phones function similarly to traditional phones but are more susceptible to background noise.

    e. Radios – A common communication medium for municipal utilities and vertically integrated utilities in which uses extend beyond operation of the BES. The communication method for radios differs from other devices because they are not full duplex devices and, therefore, do not allow simultaneous transmission from both parties. Also, radio transmissions are typically not encrypted and are accessible to third parties via scanners, etc.

    f. Government Emergency Telecommunications Service (GETS) and Wireless Priority Service (WPS) – GETS and WPS provide an emergency access and priority processing in the local and long-distance segments of the PSTN or cellular networks. GETS and WPS are intended to be used in an emergency or crisis situation when the PSTN or cellular network is congested and

the probability of completing a call over normal or other telecommunications means has significantly decreased.

    g. Satellite phones – Typically used as emergency voice communication medium between functional entities and their respective reliability coordinators. Satellite phones function similarly to traditional phones and cell phones; however, a clear view of the sky for the antenna is required. A lesson learned from the industry's Y2K preparation was that for satellite phones to be most effective in emergency/outage conditions, entities have to ensure their phones do not require transmitting through any ground relaying stations (i.e., that their phones have direct point-to-point functionality).

    h. All Call/Blast Call Functionality – Some entities utilize technology that blasts general messaging and directives with multiple entities. Blast calls and messaging systems are effective tools to rapidly share information with multiple parties or to get group action.

2. Other Communications Tools

    a. Email – Typically used to communicate information that is not time sensitive. Used to communicate system status and events to a broad array of support staff/management as well as interconnected entities.

    b. Messaging Systems – An internal system used by reliability coordinators to send messages to their Balancing Authorities (BA) and Transmission Operators (TOP) or an external system used by Reliability Coordinators (RC) to send messages to other RC (e.g., the RC Information System).

    c. Fax (short for facsimile) – Sometimes called telecopying, faxing is the telephonic transmission of scanned printed material (both text and images), normally to a telephone number connected to a printer or other output device.

II. Policies and Procedures

The following are excerpts of policies and procedures currently in use by a sampling of industry members. When developing formal communications policies and procedures, the registered entity may consider addressing the following items:

1. Policy Applicability

    a. Who – To whom the procedure applies

    b. When – Under what condition the specific communications policy or procedure is to be used (e.g., normal or emergency conditions)

    c. How – Technique to be used for emergency communications versus normal communications

        i. There are two schools of thought regarding utilization of three-part communication for routine operating instructions. Every routine communication opportunity has a

different impact on the reliability of the BES, and many routine communication opportunities have no impact on reliability. While the industry has disparate viewpoints on the necessity of the use of three-part communication for all real-time communications, most agree that the point is to be effective when it counts for reliability — not that every communication opportunity has a reliability impact.

1. One thought is that the three-part communication protocol is special and reserved to address real-time emergencies in order to make those communications stand out from normal communications.

2. Another school of thought is that the three-part communication protocol is good practice for both normal and emergency operating instructions.

d. If an entity determines it would utilize the three-part communication protocol for routine operating instructions, that entity should define when its system operators are expected to utilize the protocol, including coordinating with entities regarding when the use of three-part communication is expected. In addition, entities could consider beginning the communication with the phrase "This instruction requires a three-part communication." Further, entities should consider providing system operators a general format or a script that can be applied when using three-way communications. Some entities provide these written scripts at each system operator position and may ask the receiver to write out the transmitted directive.

2. Use of Three-Part Communication for Routine Operating Instructions[1] – The following is an example of when the three-part communication protocol for routine operating instructions could be implemented:

> SAMPLE TEXT from an internal procedure:
>
> a. For any actionable item, there should be specific three-part communication by the receiver to ensure there is no misunderstanding of the details involved. An actionable item is instruction or information conveyed in which one party is informing the other that:
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>   i. A physical change needs to be made or has been made to BES facilities pre- or post-contingency (e.g., generation starts, transmission reconfigurations, manual redispatches, voltage changes); or
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>   ii. A change needs to be made in the computer systems used to operate the BES (e.g., updating operating limits, forecasts, schedules).

3. Elements of Effective Communication

   a. Communication Etiquette – At all times, professionalism and professional tone and manner are essential. Communications are best undertaken in a courteous, business-like fashion.

   b. Opening Phrase – It is important that both parties understand with whom they are speaking; therefore, the person answering the phone or making a call should state the following information: company, location, name, and function.

   c. Acknowledgement – Whenever a call is made or received, the initiating party should clearly communicate the purpose of the call so that all issues are fully understood and addressed.

   d. Content – The person requesting action should speak in a clear and calm manner, review the information and request three-way communication, if appropriate. If any action is to be taken, the recipient will fully understand when that action is expected to be taken (e.g., now, at a specific time, or "some" time). Closing – At the end of any call, those communicating want to confirm that what was expected was completed, that no other activity is required, and whether there is a clear commitment for call-back.

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[1] While the practice of using three-part communications for routine communications may be a good practice, the failure to use three-part communications for routine communications is not considered to undermine reliability.

4. Barriers to Effective Verbal Communications

    a. Sender or receiver not stating his or her name and/or work location when using a telephone or radio.

    b. Sender attempting to communicate with someone already engaged in another conversation.

    c. Sender stating too much information or multiple actions in one message.

    d. Sender not giving enough information for the receiver to understand the message.

    e. Sender not explicitly verifying that receiver understood the message.

    f. Receiver failing to ask for needed clarification of the message, if required.

    g. Receiver taking action before the communication is complete.

    h. Receiver not writing the message on paper, if there are several items (more than two) to remember.

    i. Receiver mentally preoccupied with another task (e.g., driving, texting, personal calls).

    j. Message not being stated loudly enough to be heard.

    k. Enunciating words poorly.

    l. Distractions to communications (e.g., background noise).

III. Communications Training for System Operators

Effective communication is one of the most important defenses in the prevention of errors and events. Training provides an opportunity to ensure that personnel know their company's requirements and expectations for verbal communications, and it also reinforces good communication practices through the use of drills and exercises.

Communications training can be based on company-specific policies and procedures for verbal communications. The goal of communications training is to ensure effective verbal communications during real-time operations. The following practices are provided for consideration in the development of training exercises and drills and for management observation/coaching involving verbal communications:

1. Classroom Training and Management Review

    a. Classroom training can focus on company-specific policies and procedures for verbal communications. The trainer wants to be clear on what communications protocols are expected to be followed, when they are expected to be followed, and by whom. The trainer also wants to emphasize the benefits of following the specific protocols.

b. Classroom training on effective communication is most thorough when it addresses the following: 1) basis for use (why it is used); 2) when to use specific communications protocols (provide specific examples); 3) roles and responsibilities for each participant (include the significance of active listening); and 4) behavior expectations of each participant.

c. Effective communication principles can be reinforced during system operator training simulations, exercises, or drills. Performance objectives or competencies can be established and measured as part of these activities. Feedback assessments (both self and instructor) can be part of the communications training process.

d. Management or peer observations (e.g., operator coaching session) can be utilized to determine if the tools for effective communication are practiced by personnel in the actual job environment. These observations provide an opportunity to recognize personnel who meet or exceed expectations for use of effective communication tools. They also provide an opportunity in a non-punitive environment to coach personnel who need to improve their use of communication tools. The observations can be considered to determine if changes or improvements are needed when training on communication tools.

e. Management involvement in system operator training, exercises, and drills can be used to provide feedback and encourage a strong communications program.

2. Communication Practices – The following beneficial practices are provided for consideration in the development or modification of training on effective communication:

a. Incorporate a "Communication Topic" as part of each continuing training cycle.

b. Ensure training on communication stresses effective, active listening. Even though the "Sender or Initiator" of three-part communication is expected to ensure the message is understood, the individual(s) receiving the message want to be engaged and actively listening for effective communication to occur.

c. Use quizzes or reminders administered by email or other online testing applications to emphasize key aspects of effective communication. This tool can also be used to provide feedback on department or group level understanding of key points.

d. Incorporate internal and external operating experience related to communication as part of initial and continuing training. The operating experience can be based on: 1) management observations; 2) performance trends; 3) review of tapes from actual communication, including system events in which directives were provided; or 4) related events from other industries.

e. Use small groups or breakouts as part of training to conduct peer reviews of actual communication. Audio tapes of actual operators can be reviewed by small groups to identify proper communication and areas for improvement. In addition, system operators

may opt to review and critique their own voice recordings to identify lessons learned and opportunities for improvement.

f. Conduct training seminars or communications workshops that involve operators and other parties (e.g., receivers) they communicate with to educate all involved parties on the expectations for effective communication.

g. As part of training, incorporate videos that depict proper usage of tools for effective communication. Videos depicting operators in "real world" situations demonstrating proper use of tools for effective communication can enhance buy-in by personnel. Videos can also be used to depict scenarios in which tools for effective communication are *not* properly used. Participants can critique or identify the area(s) for improvement in the use of the tools for effective communication.

h. Structure field trips or benchmark trips to other industries (e.g., nuclear plants, aviation control centers) that allow operators to listen to another perspective. This can help reinforce a good balance on when to use three-part communication.

IV. Performance Assessment

Successful implementation of verbal communications programs often includes the development and maintenance of a comprehensive series of controls and leadership practices that develop, reinforce, and maintain effective communication. Examples of some effective elements of control programs are listed below.

1. For many reasons the electric industry records most of its operational communications. These recordings provide a rich vehicle for assessment, feedback, and learning when coupled with periodic reviews of the recordings for the elements of effective communication.

2. In line with feedback and training programs, shift supervisors or operations leaders at many operating entities assess a specific number of hours of recordings or a specific number of recordings that may cover various topical areas (e.g., switching evolutions, AVR notifications, SPS notifications, etc.) within an established period of time (e.g., every quarter or month) for each of the operators under his or her leadership. Those leaders are then expected to share their reviews with the operators involved. Such feedback is often most effective when it is provided soon after an operational event has transpired. Some entities prefer such recording review sessions be made in an informal coaching session. Other entities have tied effective communication to the very formal aspect of annual performance goals and the resulting performance reviews. Periodic assessments, including grading or scoring of calls, can quickly provide needed feedback to ensure a system operator will be successful in achieving such a performance goal throughout the course of the year. Entities may choose to reflect that success in employee performance compensation.

3. Recognition Programs – Consider development of positive reinforcement programs that recognize good system operator communications.

4. System Operator Assessments – Some entities assess the following:

   a. Was the operator following the company's communication policy?

   b. When three-part communication was required, were each of the three elements of three-part communication evident?

   c. If the receiver did not effectively repeat back the communication the first time, did the sender pursue the receiver until the receiver did repeat back the elements of the reliability directive?

   d. How professional was the actual communication in both content and tone?

   e. The focus of these reviews might involve more than the spoken word, since some entities also include reviewing the resulting field paperwork. Such reviews help organizations ensure good housekeeping and see that the complete company policy is being implemented.

5. Event Analysis

   a. If an operating entity has a system event that triggers a category 2 or higher event review in accordance with the NERC Events Analysis Process, or if the operating entity has any other event for which it wants to further assess its operations, this circumstance provides the operating entity an opportunity to delve into assessing the effectiveness of its communications.

   b. When the system event's recordings are pulled and reviewed, it provides an opportunity for leaders, operators, and trainers to assess the effectiveness of their communications as related to that event and, in some cases, to access broader operating practices.

   c. Communication often involves parties beyond the organizational structure of one operating entity. As such, when a third party (the receiver) of a communication has not facilitated effective communication (either by not following agreed-upon protocol or by unprofessionalism) this circumstance provides an opportunity for the reviewing leader to share his or her observations with the receiver's leader to enable learning across both operating entities.

V. Aids to Communication
1. Recorders – Typically used to preserve a record of conversations to assist in the review of incidents. Also used to check conversations to ensure communications are effective and appropriate.

2. System Operator Logs – Used as a knowledge transfer device between system operators in the same control room, as well as for management to respond to inquiries about situations that

occurred days, weeks or even months afterward. Used in conjunction with all other forms of communication.

3. Checklists – Used as an aid to ensure consistency in the information contained in routine communications. A typical use of a checklist is during shift turnover of system operators to ensure appropriate operating information is communicated to the system operator coming on-shift.

4. Standard Verbal Cues - To develop a common understanding of the urgency and attention required for a verbal communication entities may develop standard phraseology such as:

    a. "This is a directive": This is a simple way to let the receiver know that the next statement will relay an expected mandatory action and will require a "repeat back" of the order.

    b. "I (we) have a problem": Important information is forthcoming.

    c. "I need your help": Action is needed, albeit not for an emergency.

    d. "Are you ready to copy/write?": When you want the recipient to write down the message.

    e. "Say again": When you need the sender to repeat a message

5. Tailgate Sessions – These are information sharing sessions prior to an important job or evolution. They are a give and take briefing of the scope of the task to be done, special safety precautions and an opportunity to ask clarifying questions. The intent of the session is to ensure everyone knows the goal and has the necessary tools and information. A clear transition from a tailgate session to formal communications such as a standard verbal cue should be used.

6. Standard (or Special) Operating Instructions – These may be known by various other names. Rather than issue a set of complex instructions verbally, the sender provides an advance copy of written steps. When the order is given, the sender ensures the recipient has the correct document (name and date/version) and gives the instruction to complete certain steps or the entire procedure.

Related Documents and Links
1. *Electric Reliability Organization Event Analysis Process,* dated February 2012
   ERO Event Analysis Process
2. *DOE Standard: Human Performance Improvement Handbook, Volume 2: Human Performance Tools for Individuals, Work Teams, and Management*; DOE-HDBK-1028-2009, dated June 2009
   Human Performance Tools for Individuals, Work Teams, and Management
3. *Human Performance Tools for Workers: General Practice for Anticipating, Preventing, and Catching Human Error During the Performance of Work,* dated April 2006. Developed by the Institute of Nuclear Power Operations (INPO 06-002)

4. Reliability Standard COM-002-2 (Communications and Coordination)

Revision History

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9/19/2012	1.0	Initial Version – Reliability Guideline: *System Operator Verbal Communications – Current Industry Practices*

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