

By Lew Folkerth, Principal Reliability Consultant

Foundations - Part 1

In this recurring column, I explore various questions and concerns related to the NERC Critical Infrastructure Protection (CIP) Standards. I share my views and opinions with you, which are not binding. Rather, this information is intended to provoke discussion within your entity.

It may also help you and your entity as you strive to improve your compliance posture and work toward continuous improvement in the reliability, security, resiliency and sustainability of your CIP compliance programs.

There are times that I also may discuss areas of the Standards that other entities may be struggling with and share my ideas to overcome their known issues. As with lighthouses, I can't steer your ship for you, but perhaps I can help shed light on the sometimes stormy waters of CIP compliance.

I've had some discussions recently that point out how much background is needed to be proficient in the CIP Standards. I think it's time to look at what all CIP professionals should have in their toolbox. Some may need more depth in certain areas, but the foundations of CIP should be

fairly constant across all professionals. I don't advocate memorizing the Standards or other documents, but you should know where to find the essential documents and where to find the appropriate information within those documents.

For the purposes of this article, I'll assume you're new to the CIP Standards, but this material should be useful to all CIP professionals, even if only as a review.

Understand Our Industry

In order to identify and protect the appropriate equipment and supporting systems, you should have a basic understanding of the electric industry and how it works. The electric industry is engaged in the generation, transmission and distribution of electric power.

To have the proper context in which to understand the CIP Standards, you should understand the industry's fundamentals and the associated terminology.

Our industry is based on electricity, in particular alternating current. You should understand the difference between electric potential, measured in volts and sometimes called



Old Presque Isle Lighthouse, Presque Isle, MI – Photo: L Folkerth

“voltage,” and electric current, measured in amperes or amps. You should understand the difference between real power, measured in watts; reactive power, measured in vars; and energy, measured in watt hours.

Generation is the process of taking energy in one form, such as heat, and turning it into electrical energy.

Transmission moves the electrical energy from where it's produced (generation), to near where it's needed. **Distribution** takes electric energy from transmission and moves it to where it's finally used, known as “demand” or “load.”

Generation of electric energy must

match – on a moment-to-moment basis – the demand for electric energy.

As the demand for electric energy changes, generation must be adjusted to match so that neither too much nor too little energy is available at any time. This is known as “balancing” and is a critical process in the electric industry.

Understand the Role of Compliance in Our Industry

Priorities

As part of the electric industry, you must be aware of the proper place of compliance within the overall picture of the industry.

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Electric Industry Priorities

1. Safety
2. Reliability
3. Compliance

The first priority is the **safety** of electrical employees and the general public. The second priority is **reliability**, “keeping the lights on.” Security, both physical and cyber, is considered to be part of reliability.

The third priority is **compliance**. The purpose of the CIP Standards is to improve reliability by keeping the equipment essential to reliability secure. The concept of CIP Exceptional Circumstances written into the CIP Standards is an acknowledgment of this fact.

Risk

Regulators and industry are coming to understand that the role of compliance is to manage and reduce risks to reliability. One of our newest Standards, CIP-013-1, Supply Chain Risk Management, is explicitly written to require risk to be managed. You should be familiar with risk management methods and risk assessments.

Understand Our Essential Documents and How to Read Them Standards

In order to understand the CIP Standards, we need to understand the documents governing these Standards. First and foremost are the Standards themselves, but you need to know how to read them.

The NERC Reliability Standards, of which the CIP Standards are a part, are created according to the Standard Processes Manual. You should at least review this manual, which is Appendix 3A to the NERC Rules of Procedure, but carefully read Section 2.5.

The last paragraph of this Section tells us that the only mandatory and enforceable parts of a Standard are the applicability, the effective dates, and the Requirements.

In addition to these three enforceable components of the Standards, defined terms may be developed and approved for use in the Standards. These defined terms, once approved, appear in “Glossary of Terms Used in NERC Reliability Standards” (NERC Glossary) and are an officially recognized component of the Standards.

A Standard may also have an accompanying implementation plan containing effective dates and other information, such as initial

performance of periodic Requirements. Implementation plans are approved as part of the Standard and are also enforceable.

All other parts of a Standard are considered guidance and may not be directly enforced. This guidance can help in understanding the Standard, but it cannot override the language of a Requirement.

For example, if a statement in the Measures section of a Standard conflicts with the language of a Requirement, the language of the Requirement prevails.

Guidance

The NERC Guidance Policy defines two types of approved guidance documents: Implementation Guidance and Compliance Monitoring and Enforcement Program (CMEP) Practice Guides.

Implementation Guidance is developed by industry and approved for adoption by the ERO. It provides examples of how a Standard or Requirement might be implemented.

CMEP Practice Guides are instructions for auditors and other CMEP staff to consider when assessing compliance to a Standard. They are developed by the ERO Enterprise and posted publicly.

Guidelines

Guidelines are developed by one or more NERC standing committees and are posted to the NERC website. Guidelines provide recommendations on how to improve or maintain the reliability of the BES. Although they are not enforceable, industry is encouraged to understand and follow them.

Requests for Assistance

If you are an entity registered within the RF Region and believe you need assistance in sorting your way through this or any compliance related issue, remember RF has the Assist Visit program. Submit an Assist Visit Request via the RF website [here](#).

Feedback

Please provide any feedback you may have on these articles. Suggestions for topics are always welcome and appreciated.

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