System Operator Certification Program
Administrative Guidelines

DRAFT for COMMENTS

Send your comments to soccep@nerc.com by
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Maintaining
NERC System Operator Credential
Through the Use of
Continuing Education Credit Hours

North American Electric Reliability Council

Executive Summary

The Personnel Subcommittee (PS) and the Personnel Certification Governance Committee (PCGC) are seeking to implement a method to use continuing education credit hours to maintain a system operator's credential rather than re-taking a NERC certification exam. The Personnel Subcommittee's Continuing Education Program is the first step in that direction; the program provides a mechanism for learning-activity providers to register and obtain approval for their continuing education programs. The PCGC's proposed System Operator Certification Continuing Education Program will allow system operators to accumulate continuing education credit hours in specified subjects and apply them toward maintaining their system operator credential. This white paper is designed to inform system operators about the program and to solicit their comments. The PCGC will review the comments received during this review period and adjust the proposed program as appropriate. The PCGC will also determine an implementation date.

Details

The program provides that:

- New candidates will have to pass an exam to earn a credential that will be valid for three years;
- A certificate, valid for three years, will be issued to successful candidates;
- Certified system operators will have to accumulate a specified number of continuing education credit hours (CEH), in specific subjects before their certificate expires to maintain their credential:
    - 240 CEH for Reliability Coordinator,
    - 180 CEH for Balancing and Interchange/Transmission Operator,
    - 120 CEH for Balancing Operators, and
    - 120 CEH for Transmission Operators;
- If the certified operator submits the proper number of CEH in the proper subjects, they will be issued a new certificate valid for another three-year period;
- Retaking the exam will not be an option;
- If a system operator does not accumulate enough CEH prior to the certificate expiration date, their credential will be suspended (for organizational compliance to NERC policy/standards, a suspended credential is not a valid credential);
- The credential will be suspended for a maximum of one year, at the end of which the credential will be revoked;
- If, prior to the end of the one-year suspension, the system operator accumulates the proper number and type of CEH, their credential will be reinstated with the original expiration date (three years from the previous expiration date);
- If the system operator does not accumulate the proper number and type of CEH prior to the end of the suspension period, their credential will be revoked and they will have to take an exam to become certified again;
- Taking an exam will not be allowed until the suspension period has expired.

Transition

A transition process has been designed so that people with current 5-year certificates can transition to the 3-year program; it also allows operators certified at one level to transition to another level. The program is intended to allow people holding a reliability coordinator credential but not working as reliability coordinators to transition to a credential that more closely matches the work they perform without taking a new exam. People currently holding a transmission or balancing credential will have to pass an exam to move to the combined balancing and interchange/transmission credential or the reliability coordinator credential.

NERC System Operator Certification Phase II Preamble

The NERC system operator certification program consists of four exams, one for each of four specialties: Transmission Operator, Balancing and Interchange Operator, Balancing and Interchange/Transmission Operator, and Reliability Coordinator. The exam content is geared toward new system operators acquiring their initial certification. Successfully passing one of the exams affirms that the system operator has at least a basic understanding of system operations. NERC's expectation is that the system operator's employer will complete the necessary on-site training before allowing that system operator to hold a shift with specific responsibilities.

When the System Operator Certification Program was implemented in 1998, the plan was to have a continuing education program in place before the first group of certifications started expiring in 2003. Because the continuing education program did not develop as quickly as hoped, system operators have had to retake the initial test and become re-certified. This retest reaffirmed that the system operators had at least as much knowledge as when they took the test five years before.

The industry in general, and system operators in particular, recognize that this is not enough. Some method of affirming knowledge growth and performance improvement must be devised in order to better the NERC certification program. One of the primary purposes of continuing education is that it promotes ongoing development of an operator's knowledge, rather than simply re-affirming an individual's basic knowledge of principles and policies. It is hoped that by increasing a system operator's knowledge, the performance of the system operator will improve as well. System operators have enthusiastically expressed an interest in such a program.

Comments:

Thank you for the opportunity to comment on this important topic. The IRC supports the whitepaper's intent of setting high standards in continuing education for system operators and the development of resources to provide this training.

Goals

In light of the foregoing, the following goals have been set in place:

1. Establish mandatory continuing education criteria to maintain certification with the goal to improve system operator performance by increasing their knowledge in their job tasks.
    1.1. Establish criteria for NERC-certified system operators to maintain a credential through the use of continuing education credit hours.
2. Establish an electronic process to register and document continuing education credit hours earned by certified system operators through NERC CE Program approved learning activities.
    2.1. The process of registering continuing education credit hours will be done electronically. System operators and training providers may continuously update their information.
3. Establish a mandatory process to maintain the credential of NERC-certified system operators by meeting continuing education credit hour requirements established by NERC.

Comments:

We support the development of an electronic repository for CE hours.

IRC members suggest that re-testing be retained, at a minimum, as an available option fro re-certification under extraordinary circumstances. Re-certification exams of this nature should cover a greater breath than only NERC policy and fundamentals.

For example, the whitepaper does not provide a safeguard for those situations where an operator's personal situation precludes pursuing CE toward the end of their 3-year cycle and they therefore could lose their employment. Examples where this could happen are extended callups in the military reserves, jury duty or illness.

Section I — Introduction

Recognizing Continuing Education

The NERC system operator certification process recognizes the interest and the responsibility of system operators to continue their educational and professional development throughout their career. Phase I of the System Operator Certification Program provided the framework for the initial exams used to obtain certification in one of four NERC credentials: Transmission Operator, Balancing and Interchange Operator, Balancing and Interchange/Transmission Operator, and Reliability Coordinator. Phase II of the system operator certification program provides the framework for the use and tracking of continuing education credit hours for the purpose of maintaining the credential over time that was initially earned by passing an exam.

The purpose of allowing system operators to maintain a credential through the accumulation of continuing education credit hours is to actively promote the use of NERC-approved continuing education learning activities for maintaining proficiency and professional development. The NERC-approved learning activities are monitored by the Personnel Subcommittee to ensure that they are well developed and delivered consistent with the objectives of the NERC CE Program.

Comments:

Governance and Administration of the System Operator Certification CE Program

Governance: The NERC Personnel Certification Governance Committee (PCGC) is the governing body that establishes the policies, sets fees, and monitors the performance of the system operator certification program.

Administration: NERC administers the certification program. As program administrator, NERC maintains databases, records, and applications, collects fees, and provides reports on the certification related activities. NERC also maintains master files containing certification records, program audits and CEH awarded.

Comments:

Funding the System Operator Certification CE Program

The PCGC shall ensure the program is financially sound. The program shall be reviewed periodically to ensure NERC administrative fees are adequately recovered through program fees.

Phase I — the exam program. The cost of governing, developing, and administering the exams is paid by the fees collected to take an exam.

Phase II — maintaining a credential through accumulating continuing education credit hours. The cost of governing, developing, and administering Phase II must be paid by the fees collected to participate in the certification program. The cost to provide Phase II has yet to be determined. The fees will be set according to the cost.

Comments:
This approach seems reasonable.

Continuing Education Credit Hours to Maintain a Valid Credential

The current NERC system operator certification examinations focus on verification of the basic competence of system operators. The certification exams address basic principles of interconnected operations and system operator tasks as they relate to NERC operating policies and power system operations. Those who pass an exam are granted a five-year credential associated with that exam.

As proposed, upon passing the exam, the successful candidate will receive a three-year credential associated with that exam: Transmission Operator, Balancing and Interchange Operator, Balancing and Interchange/Transmission Operator, and Reliability Coordinator. NERC-certified system operators will then have to accumulate a specific amount of credit hours in NERC-approved CE learning activities in specific subjects within a specific time period in order to maintain their NERC credential. This process is described below for each of the four credentials:

Comments:
See our earlier comments on differing opinions on elimination of re-testing.

It will be more difficult to handle the administration of a 3-year program, particularly for those organizations with many system operators. It's unclear why the credential needs to be shortened.

Several of the NERC V0 standards require operator training in various topics. The hours and subjects mandated in the standards should apply to the required hours in the CE program.

Transmission Operator Certification

After completing and passing an initial NERC Transmission Operator certification exam, the candidate is awarded a NERC credential as a Transmission Operator. A certificate will be issued that is valid for three years. To maintain a valid Transmission Operator credential, system operators must earn 120 CEH within the 3-year period preceding the expiration date of their certificate.

The 120 CEH must include:

- 30 CEH on NERC operating policies and standards.
- 90 CEH related directly to transmission operator tasks. (See Appendix A for recognized training topics.)
  - As a minimum, 30 of these 90 CEH must utilize simulations (i.e., table-top exercises, dispatcher/operator training simulators, emergency drills, or practice emergency procedures, restoration, blackstart or other reliability based scenarios).

Comments:

There were differing opinions with the IRC on the mandatory hours for each occupation. Some felt the hours should be the same for all occupations. Others agreed with a tiered approach.

In general, the requirements should not be overly prescriptive as it will become difficult to judge which category a particular training event will fit and it will be more dfficult for operator to meet the requirements. We suggest leaving some flexibility, (such as 150 CEH total, 30 related to policy and standards, 60 job-related, the remainder can be from any area in an approved industry list. Of the 150 hours, 30 hours should be simulation or drill based).

One option would have a set of core courses common to all functions (RC,TO, BA/IA) so if an operator who was a RC has to re-qualify due to an absence which caused a deficit in the required # of CEH then he may quickly be able to qualify for say an TO while regaining the credits to become a RC again

Balancing & Interchange Operator Certification

After completing and passing an initial NERC Balancing and Interchange Operator certification exam, the candidate is awarded a NERC credential as a Balancing and Interchange Operator. A certificate will be issued that is valid for three years. To maintain a valid Balancing and Interchange Operator credential, system operators must earn 120 CEH within the 3-year period preceding the expiration date of their certificate.

The 120 CEH must include:

- 30 CEH on NERC operating policies and standards.
- 90 CEH related directly to balancing and interchange operator tasks. (See Appendix A for recognized training topics.)
  - As a minimum, 30 of these 90 CEH must utilize simulations (i.e., table-top exercises, dispatcher/operator training simulators, emergency drills, or practice emergency procedures, restoration, blackstart or other reliability based scenarios).

Comments:
See ealier comments.

Balancing, Interchange & Transmission Operator Certification

After completing and passing an initial NERC Balancing and Interchange/Transmission Operator certification exam, the candidate is awarded a NERC credential as a Balancing and Interchange/Transmission Operator. A certificate will be issued that is valid for three years. To maintain a valid Balancing and Interchange/Transmission Operator credential, system operators must earn 180 CEH within the 3-year period preceding the expiration date of their certificate.

The 180 CEH must include:

- 30 CEH on NERC operating policies and standards.
- 150 CEH related directly to Balancing and Interchange/Transmission Operator tasks. (See Appendix A for recognized training topics.)
  - As a minimum, 30 of these 150 CEH must utilize simulations (i.e., table-top exercises, dispatcher/operator training simulators, emergency drills, or practice emergency procedures, restoration, blackstart or other reliability based scenarios).

Comments:
See earlier comments.

Reliability Coordinator Operator Certification

After completing and passing an initial NERC Reliability Coordinator Operator certification exam, the candidate is awarded a NERC credential as a Reliability Coordinator Operator. A certificate will be issued that is valid for three years. To maintain a valid Reliability Coordinator Operator credential, system operators must earn 240 CEH within the 3-year period preceding the expiration date of their certificate.

The 240 CEH must include:

- 30 CEH on NERC operating policies and standards.
- 210 CEH related directly to Reliability Coordinator Operator tasks. (See Appendix A for recognized training topics.)
  - As a minimum, 30 of these 210 CEH must utilize simulations (i.e., table-top exercises, dispatcher/operator training simulators, emergency drills, or practice emergency procedures, restoration, blackstart or other reliability based scenarios).

Comments:
See earlier comments.

Deficits of CEH for Credential Holders

An individual holding a NERC credential who does not accumulate the required number and balance of CEH within the three-year period will be deemed deficient and their credential will be suspended on the date they become deficient. The credential holder will be given up to 12 months to acquire the necessary CEH, during which time their credential will remain suspended. (An operator with a suspended credential cannot perform any task that requires an operator to be NERC-certified.) If more than 12 months elapse, the credential will be revoked. The operator will be required to take an exam to become certified again. During the time of suspension, the original anniversary date will be maintained. Therefore, should the system operator accumulate the required number of credit hours within the 12-month suspension period, the system operator will, again, be required to accumulate the required number of credit hours prior to the original 3-year anniversary date.

- For example: a system operator's credential expires on July 31, 2007, but does not accumulate the required number of credit hours prior to that date:
  - The credential will be suspended on July 31, 2007.
  - If the system operator then accumulates the required number of credit hours by March 1, 2008, the credential will be reinstated on March 1, 2008, and will be valid until July 31, 2010.

- The system operator will have to accumulate the required number of credit hours prior to July 31, 2010, or the credential will be suspended again. Those CEH previously used to maintain the credential cannot be reused in the current period.
- A record of the suspension between July 31, 2007, and March 1, 2008, will be maintained.

Comments:

See the earlier comments. As a minimum, NERC must have some safeguard for those operators whose situation legitimately does not allow them to complete requirments.

While IRC membes thought that if there was a shortend cycle and no retest option, there needed to be safegard in the process (a reduced credential, a probationary period, etc.).

CEH Earned by Operators for Maintaining a Credential

1. The NERC-certified system operator seeking to maintain the credential must submit proof of having acquired the necessary CEH from a NERC-approved provider or a NERC approved learning activity. These submittals will be made electronically into the NERC certification database.
   - 1.1. Operators will be able to track their status/progress towards maintaining their credential continuously.
   - 1.2. Certified system operators must review their CE credit hour records at least 90 days before their credential expiration date to allow sufficient time to acquire, and apply CEH prior to the operator's certificate expiration date.
   - 1.3. To ensure their credential does not get suspended, the system operator must submit proof of sufficient CEH to NERC 30 days before the system operator's certificate expiration date. Submissions received at NERC within the 30-day window may not be credited to the system operator's account in time to prevent the credential being suspended.
2. For system operators who meet the CE credit hour requirements, NERC will extend their certificate's expiration date for three years (a new certificate will be mailed to the address on record).
3. System operators whose CE credit hour submittal is found to be incomplete will be deemed to be deficient and their credential will be suspended.
4. CEH in excess of the required amount cannot be carried over from one three-year period to the next.

Comments:

Should not the CE provider and/or local trainer be primarily responsible for inputting CEH information into the NERC database?

Changing Certification Levels

A certified system operator can change the type of the credential they hold by indicating this change on their credential maintenance application. A system operator has the following options:

To change a credential from:

- Balancing and Interchange Operator to any other NERC credential: the system operator must pass the exam for that credential.
- Transmission Operator to any other NERC credential: the system operator must pass the exam for that credential.
- Balancing and Interchange/Transmission to Reliability Coordinator: the system operator must pass the exam for that credential.
- Reliability Coordinator to any other NERC credential: the system operator must submit the proper number and type of hours for the new credential.
- Balancing and Interchange/Transmission to Transmission Operator or Balancing and Interchange Operator: the system operator must submit proper number and type of hours for the new credential.

Comments:

Transition Plan — From a 5-year Program to a 3-year Program

An individual whose credential expires during the first three years after implementation of this System Operator Certification Continuing Education Program has the option to either accumulate the required number of CEH for extension of their credential expiration date or pass the exam for the desired credential; either way, they will receive a three-year extension of their certificate's expiration date. Individuals whose credential expires after the third anniversary of the implementation of this program must accumulate the required number CEH prior to the expiration date of the certificate.

Comments:
See the earlier comments. The shorter cycle could be problematic and the reasoning for shortening the cycle has not been explained.

Section II — Program Rules

Rules for NERC-Certified System Personnel

1. **Selection of learning activities —** System operators must select appropriate learning activities for the credit hours to be applied to maintain their credential. Learning activities chosen must address knowledge and skills to meet tasks performed by that function.

   (For example: a learning activity approved for maintaining a Balancing and Interchange Operator credential will not be recognized for maintaining a Transmission Operator credential unless that learning activity has also been approved for Transmission Operators.)

   1.1. CEH will be recognized from NERC-approved providers and from NERC-approved learning activities only.

   1.2. General areas of study are: NERC and regional standards, policies and procedures; technical concepts; and the associated systems, processes and business rules related to balancing and interchange, transmission operations, and reliability coordinator functions. See Appendix A for recognized training topics.

2. **Recognized learning activities only —** System operators must comply with all applicable credential maintenance program requirements, and CEH will be recognized only for learning activities where the CE Program sponsors have complied with the standards for NERC approval for issuance of CE hour credits.

3. **Provider access to database —** Rules for providers to input information concerning CEH delivered when database is developed and process is determined.

4. **System Operator access to database —** Rules for system operators to input information concerning CEH received when database is developed and process is determined.

5. **Retain documentation** — The credentialed individual is responsible for the accurate and timely reporting of the appropriate number of CEH earned and must retain adequate documentation of their participation in approved CE learning activities including:

   5.1. Name and contact information of the learning activity sponsor,
   5.2. Title of the learning activity and description of its content,
   5.3. Date(s) of the learning activity,
   5.4. Location (if applicable),
   5.5. Number and type of CE hour credits, all of which must be included in documentation provided by the sponsor, and
   5.6. NERC certificate number.

   In the absence of legal or other requirements, documentation must be retained until credential extension is granted.

6. **Learning activity credit only once per year** — CEH for a particular course or learning activity will not be recognized for maintaining a credential more than once during a calendar year.

   Exception: Courses dealing with emergency operations will be recognized no more than two times during a calendar year.

7. **Providers whose approved status is revoked after granting CEH** — CEH granted by a NERC-approved provider for a course or learning activity that had been approved for

maintaining a credential, will still be recognized if, subsequent to the course or learning activity taking place, the approved status is revoked.

8. **Instructor credits** — 1.0 CE credit hour for each CE credit hour of a learning activity will be recognized towards maintaining the instructor's credential. CEH will be recognized one time per year for a learning activity, regardless of the number of times the learning activity is given.

Comments:

The "Exception" noted in item 6 should be re-worded. It appears to say that an operator cannot participate in more than two training events related to emergency operations. The wording should be changed to say that "Emergency operations training (with the same learning objectives) may be recognized no more than two times during a calendar year.".

Instructors spend significant time preparing for training events. There should be some additional credit offered to acknowledge this.

Appendix A

Recognized Operating Training Topics for Maintaining NERC System Operator Credentials

Reliability Coordinator

- Interconnected Power System Operations — basic electricity, production and transfer of energy, reactive power flow, MW and Mvar reserves, ACE components and concept, CPS and DCS components and concepts, formulating operational plans, concept of frequency control, evaluating interchange schedules, evaluate operating plans of balancing authority, evaluate operating plans of transmission operator, system control, telemetry, system protection, and system stability.
- EHV Operations — system protection schemes, power system operations, power system component interaction, effect of generator injection on power flow, surge impedance loading, transformer saturation, and solar magnetic disturbance.
- Emergency Operations — NERC, ISO/RTO, regional, and local policies and procedures, line loading relief procedures, load shedding, and emergency operating plans.
- Power System Restoration — restoration philosophies, determining extent of outage, determining islands, synchronizing philosophies, black-start, and restoration plans.
- Tools — SCADA, advanced applications, load forecasting, system state estimator, evaluating power flow, real-time contingency analysis, voltage stability analysis, transient stability analysis.
- Communications — effective communication skills (how to give orders, communicate in emergency conditions, effective listening skills, etc.), dispute/disagreement resolution, ability to write brief, concise reports of a system event or action.
- Congestion Management
- Recognize and Operate during System Emergencies — loss of facilities, communications, and system tools, generation deficiencies, transmission contingencies, and physical and cyber sabotage.

Balancing and Interchange/Transmission Operator

- Interconnected Power System Operations — basic electricity, production and transfer of energy, MW and Mvar reserves, economic operation, system control, energy accounting, telemetry, confirm interchange schedules, and operate the integrated generation and transmission system.
- Generation — monitor on-line generator performance, track dynamic Mvar capability, respond to frequency deviations, understand and respond to CPS and DCS, coordinate operational plans and unit commit/decommit schedules from generation operators.
- Communication — effective communication skills (how to give orders, communicate in emergency conditions, effective listening skills, etc.), dispute/disagreement resolution, and ability to write brief, concise reports of a system event or action.

- EHV Operations — system protection, system stability; monitor, implement and coordinate operating procedures, assess the reliability impact of planned and forced transmission outages.
- Emergency Operations — NERC, ISO/RTO, regional, and local policies and procedures, line loading relief procedures, load shedding, emergency operating plans, and implement emergency operation procedures.
- Power System Restoration — restoration philosophies, black-start, and restoration.
- Tools — EMS, SCADA, advanced applications (state estimation, real-time contingency analysis), load forecasting, and energy accounting.
- Congestion Management
- Outage Procedures — planning, switching procedures, protective card procedures, reporting, and communications.
- Recognize and Operate during System Emergencies — loss of facilities, communications, and system tools, generation deficiencies, transmission contingencies, physical and cyber sabotage.
- Market Operations — market rules, OASIS, NERC tagging, tariffs, transmission rights, and market tools.

Transmission Operator

- Interconnected Power System Operations — basic electricity, production and transfer of energy, Mvar reserves and reactive power flow, economic operation, transmission system control, energy accounting, telemetry, system protection, and system stability.
- EHV Operations — purpose and limitations of system protection schemes, understand power system operations, power operations and limitations of system components (breakers [oil, gas], disconnects [manual, motor operated, air blast, whip], fuses), power system component interaction, effect of generator injection on power flow, surge impedance loading, transformer saturation, and solar magnetic disturbance.
- Communications — effective communication skills (how to give orders, communicate in emergency conditions, effective listening skills, etc.), dispute/disagreement resolution, and ability to write brief, concise reports of a system event or action.
- Emergency Operations — NERC, ISO/RTO, regional, and local policies and procedures, line loading relief procedures, load shedding, and emergency operating plans.
- Power System Restoration — restoration philosophies, black-start, and restoration.
- Tools — SCADA, state estimator, real-time contingency analysis, and operator load flow.
- Outage Procedures — planning, switching procedures, protective card procedures, reporting, and communications.
- Recognize and Operate during System Emergencies — loss of facilities, communications, and system tools, generation deficiencies, transmission contingencies, physical and cyber sabotage.

Balancing and Interchange Operator

- Interconnected Power System Operations — basic electricity, production and transfer of energy, Mw reserves, understand ACE components and concept, formulating operational plans, understand concept of frequency control, evaluating interchange schedules, system control, and telemetry.
- Generation — monitor on-line generator performance, track dynamic Mvar capability, respond to frequency deviations, understand CPS and DCS components and concepts, coordinate operational plans and unit commit/decommit schedules from generation operators, capabilities of different types of generators (peakers, combined cycle, coal, oil, gas, nuclear, hydro, geothermal), frequency response characteristics.
- Emergency Operations — NERC, ISO/RTO, regional, and local policies and procedures, line loading relief procedures, load shedding, and emergency operating plans.
- Power System Restoration — restoration philosophies, and black-start.
- Tools — EMS, load forecasting, and energy accounting.
- Communications — effective communication skills (how to give orders, communicate in emergency conditions, effective listening skills, etc.), dispute/disagreement resolution, and ability to write brief, concise reports of a system event or action.
- Congestion Management — Understand concept.
- Recognize and Operate during System Emergencies — loss of facilities, communications, and system tools, generation deficiencies, transmission contingencies, and physical and cyber sabotage.
- Market Operations — market rules, OASIS, NERC tagging, tariffs, transmission rights, and market tools.

Additional Comments:

The lists provided are a good start. They should be expanded to something that approximates the current Appendix 8 B and NERC's previous attempts at an operator Job Task Analysis.