

Background

The System Personnel Training SAR Drafting Team thanks all those who submitted comments with the posting of the first draft of the SAR for personnel training. After careful review and consideration of all comments received, the drafting team has prepared a revised SAR for additional comments.

The drafting team posted the first draft of its SAR for comment from 12/07/04–01/07/05. The drafting team received 19 sets of comments. The comments can be viewed in their original format at:

ftp://www.nerc.com/pub/sys/all_updl/standards/sar/System_Personnel_Training_Comments.pdf

If you feel that the drafting team overlooked your comments, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Vice President and Director of Standards, Gerry Cauley at 609-452-8060 or at gerry.cauley@nerc.net. In addition, there is a NERC Reliability Standards Appeals Process.

Introduction

The public comments on the latest standards authorization request for the NERC Training Standard revealed that the SAR did not explain adequately the intent of the proposed training standard nor the concepts upon which that standard would be based. This response provides more detail, and, along with the revisions we have made to the SAR, should provide greater comfort to those who identified key issues with our previous draft.

The SAR drafting team noted three common concerns among these public comments, specifically that the standard seemed to:

1. Unduly prescribe the details for training programs,
2. Cover too broad a range of operating personnel, and
3. Require a “one size fits all” approach to training

The comments also indicated some confusion surrounding the separation and interdependencies of training, personnel certification, organization certification and continuing education, which we will clear up as well.

This response to the public comments is divided into five sections:

1. General explanation of the concepts of the standard,
2. What the standard *does not* cover,
3. Responses to the three common concerns listed above
4. Responses to all other comments, and
5. Drafting team roster with email addresses and phone numbers. The team will be glad to answer your questions.

Applicability of the Standard

The scope of the initial training standard will be limited to the initial training of new staff and the continuing education of existing staff performing operating tasks in real-time that directly impact the reliability of the Bulk Electric System (BES).

The Goal of the Training Standard: Competency

The goal of operator training is to develop *competency*, which is “the ability to do something well or to a required standard.”¹ Competent system operators understand the tasks they are expected to perform and how to do those tasks. They also understand the reliability standards to which they and their organizations are held accountable. The organization, in turn, must design and implement its training program to ensure this competency. The proposed NERC training standard includes the requirements for these training programs.

¹ Source: Encarta Dictionary

Approach to Developing A Training Standard

The approach of the revised SAR for a training standard is to be flexible to the industry in determining their unique training needs and not try to force a single set of training topics on a widely diversified audience. To provide for flexibility is not a compromise on the quality of training and is in fact quite the opposite. Quality training results from applying a systematic approach to training that includes training needs assessment, training development, delivery, and evaluation. Using this process, an organization can identify training needs and deliver quality training that eliminates competency gaps. Not using this fundamental process for training, or leaving out any step in the process, will not produce training that can validate competency required for job performance.

The primary purpose of training is to produce competency where a gap exists between ability (or performance required for the job) and the existing competency of a person performing that job. A systematic approach to training starts by determining performance requirements. You must know what performance is required before you can say the capability to perform exists or not. Determining performance requirements simply means knowing what a person is supposed to be able to do, and is only the first step in determining and delivering training that produces needed competency. Once you know what is supposed to be done and how well (performance requirements), you must then determine the existing level of competency of personnel performing those tasks. The process for determining the difference between required competency and existing competency, which is a competency gap, is termed training needs assessment.

Valid training is the result of a systematic approach to identify performance deficiencies and correcting the lack of ability to perform with valid training. Training, without attention to other performance factors such as tools, etc. required to do a job cannot make performance happen. Training, when done using a systematic approach, can guarantee competency, or the ability to perform. However, training, without attention to other performance factors such as tools, procedures, etc. required to do a job, cannot make performance happen.

The approach to a training standard could be to select a list of topics that must be covered and a specific number of hours per year of training. That approach would guarantee nothing in terms of competency. Learning might occur, but whether or not the right learning occurred would be unknown without a method for validating learning. That is the principle of the systematic approach to training – training is a process that, without each of its critical elements, cannot guarantee competency. Without competency performance will not occur as desired.

The approach being proposed in the revised SAR, will be based on the fact that developing and maintaining an effective training program involves a number of steps:

1. **Determining the needs for training** through a task analysis or job and task analysis process, followed by a training needs assessment. This step enables the organization to know what training its operators need.
2. **Designing and adjusting the training program** to make sure it directly correlates performance requirements, learning objectives, and learning evaluation to tasks. The training program must be designed to bring the system operators from their current level of competency to the organization's desired level of competency.

3. **Developing the training program** to include effective learning experiences and delivery methods. The approach to this step, as well as step 2, will drive the requirements for training and operating staffs.
4. **Delivering the training to the personnel** to ensure that the training actually takes place as designed.
5. **Verifying and documenting the competency** that the personnel achieved through a documented assessment process.

When all of these steps are correctly applied, training will be able to validate competency. The omission of any step means that the training cannot guarantee the desired competency. The training standard includes all five of these steps, and measures compliance by requiring documentation that these steps were performed. If the process is followed, credible training will result. If the process is not followed, the needed learning may not occur.

Requirements the Training Standard Does Not Include

Does not specify the number of hours of training the organization must deliver, with one exception: that every system operator must receive at least 32 hours of training in emergency operations. This training was specifically required in NERC's original recommendations following its initial investigations into the August 2003 blackout and the drafting team agrees it must be in the training standard until data substantiates another number.

Does not specify who must be trained. That's the purpose of the job and task analysis. The Personnel Subcommittee (PS) is conducting a job and task analysis to provide the industry with a solid base of tasks that impact reliability. (See text box at right on Determining Tasks.)

Does not list the training subjects that must be taught. The subjects must be germane to the tasks that the system operators perform, and these are revealed through the job and task analysis. Even though the PS is supplying the majority of operator tasks that directly impact reliability, the list is neither complete, nor does it specify specific training requirements for an organization. A needs assessment must still be conducted by each organization to determine the training needs of their personnel.

Does not require operator certification or specify who must be certified. NERC certification of personnel is not covered by this standard.

Determining tasks

The proposed training standard will require every organization to determine the tasks that its operating personnel perform. This is accomplished through a task analysis or a job and task analysis (JTA). Organizations with long-established training programs conduct JTAs whenever needed to ensure their training programs include the proper content. But most organizations, especially those who do not have their own training programs, probably don't perform JTAs.

The proposed standard does not require the organization to perform a formal JTA. It does require the organization to explain how it identified the tasks for which its training program was designed.

To help the industry identify these critical operating tasks, the NERC Personnel Subcommittee is conducting three studies. The first study determined the competencies of excellent operators. The second will identify the tasks done by operating personnel that directly impact reliability. The third will identify tasks performed by support personnel that directly impact reliability. The results of the first two studies will be factored into the initial training standard. In late 2006, the study of support personnel tasks will be included in a revision to the training standard. Organizations may use this "generic" JTA to identify those operating personnel who must be included in their training program, but they must conduct a training needs assessment to determine the specific training needs of their personnel.

Does not specify how many hours of NERC continuing education a system operator must have for renewal of a NERC certificate.

Does not require a specific number of training staff. The number of qualified training staff is a function of training needed to maintain qualified operating personnel, which must be determined by each organization. Staffing with qualified personnel to operate is a responsibility of each organization impacting the reliability of the BES.

Does not require an operator training simulator, though it does require simulation training as part of the training in emergency operations, the standard must certainly encompass training using simulators

Does not accredit training programs. If the systematic approach to training is followed, training programs will be credible and produce the desired competency.

Responses to General Comments

In this section of the drafting team's response, we will focus on the three most common comments.

Comment 1. The Training Standard Is Too Prescriptive

Comments from Guy Zito, Kathleen Goodman, Ralph Rufrano, Greg Campoli, Pete Lebro, Roger Champagne, Khaqan Khan, Al Adamsom, David Kiguel, Robert Pelligrini, David Little, Brian Hogue, and Jerry Mosier stated that:

“There needs to be the flexibility to tailor the training to the individual involved. Requirements should be limited to Certification Standards. NERC is being overly descriptive of "how to" conduct training rather than achieving specific results. NERC Standards should be "object oriented," that is, specify what the final requirements are. Prescribing how each entity goes about to achieve these objectives is beyond NERC's mandate.”

Response

The training needs of each organization and each individual are different because each organization has a somewhat different set of tasks assigned to an individual, and each individual has different levels of competency for the set of tasks that is their job. The approach of the revised SAR is to provide maximum flexibility to the industry by requiring a fundamentally sound process to be followed in determining training needs for operating personnel in a specific organization. It would be overly prescriptive to list a set of topics that must be taught to all system operators for some arbitrary number of hours per year. The drafting team cannot know the training needs of each organization in the industry. That is why the approach was taken in the revised SAR to require that a valid process for determining training needs be followed by each organization employing operating personnel that can impact system reliability.

As we listed in the section “Requirements the Training Standard Does Not Include,” the proposed training standard does not overly or unduly prescribe *how* training must be administered or *how* many courses must be taught. It does, however, require all

organizations to determine *what* their system operators do and then develop training programs to ensure that the system operators perform those tasks and responsibilities competently. This is not being unduly prescriptive—in fact it’s quite the opposite. For a training program to be effective, especially when associated with a certification program, it must be flexible enough to train to the *tasks* that the organization’s personnel perform. This is the way effective training programs are developed in all industries which are striving to achieve excellence through competent performance of their personnel.

As to the results of the training program, those are measured through the organization’s assessments and examinations of its students that the organization must conduct.

Comment 2. The Training Standard Is A “One Size Fits All”

Comments from Karl Tammar, Dale McMaster, Ed Riley, Sam Jones, Peter Henderson, Peter Brandien, Bill Phillips, Bruce Balmat, Charles Yeung stated that:

“However, the proposed standard appears to apply a "one size fits all" approach to every authority and function. If this is the case, then this approach is likely to be unrealistic. It should be clear as to which functions should be certified versus having taken accredited courses. Also, clarity is needed that there will be different types of certification rather than just NERC Operator Certification. NERC needs to better define the scope of this standard. Is the intent of the standard to measure compliance of the training of (reliability entity) personnel regarding NERC Reliability Standards, or is the standard meant to measure compliance of all Training Programs? If the intent is the former, then the question is ‘Is there enough material to really test since some of the NERC standards applying to owners, for example, only require communications of data?’ If the intent is the latter, then the question is, ‘Is NERC the right organization to evaluate in-house training programs given the diversity of operating approaches used in North America?’ In this case, some programs are probably better evaluated by those closer to the needs and responsibilities of the individual organization.”

Response

We received similar comments from others, or the reverse comment that the training standard must be flexible enough to provide the appropriate training for the tasks that are performed. We agree and have limited the scope of the revised SAR to system operators performing tasks that will directly impact real-time system reliability as identified by the Personnel Subcommittee’s proctored Job and Task Analysis. The studies are targeted for completion in the 2nd quarter of 2006. The task list derived from the PS’s JTA will not and cannot be all inclusive. Organizations must still conduct a needs assessment to determine training needs for the operating tasks their operators perform .

The proposed training standard does not take a “one size fits all” approach. In fact, to be truly effective, it can’t because effective training must be tailored to the *tasks* that system operators perform, not whether they work for an organization who registers as a particular responsible entity as defined in the functional model, such as a Transmission Operator or Reliability Coordinator.

For example, all Regional Transmission Organizations have registered as transmission operators, and most—but not all—of their members have as well. However, not all RTO operating personnel perform physical transmission switching *tasks* and their training program would not need extensive instruction in those switching operations. On the other hand, the RTOs' members who operate SCADA centers do need training in transmission tagging and switching *tasks*, but may not need training in wide-area contingency analysis. That is a *task* the RTO staff handles because the RTO, not the SCADA operator, has the wide area view.

The RTO's job and task analysis will reveal that its system operators do not perform transmission switching tasks, and the RTO member's JTA will reveal that its personnel do. Of course, we expect these organizations already know this, but this example shows that the training programs for the RTO as the Transmission Operator and its member as a Transmission Operator may not be the same, and, in fact, the training standard will require that each organization's training program be tailored to the tasks that its operating personnel perform.

The proposed training standard does not require that training programs be accredited or approved, and, as we explained earlier, is not intended to specify personnel certification requirements. Those requirements are in other NERC standards and will be reviewed by the Personnel Subcommittee upon completion of the Training Standard. Training is a much broader issue than certification.

Comment 3. The Scope of the Training Standard Is Too "Wide" Or Too "Deep"

James Stanton commented that:

"The proposed Standard is overly broad and ambiguous, and should not uniformly apply to anyone."

NPCC noted that:

"... anyone engaged in direct operating/control activity for the Bulk Power System should be properly qualified/certified. An alternative approach to the above also discussed might also involve only requiring NERC Certifiable Functions i.e. Reliability Authority (RC), Balancing Authority, Interchange Authority, Transmission Operator to adhere to the resultant standard."

Karl Tammar, Dale McMaster, Ed Riley, Sam Jones, Peter Henderson, Peter Brandien, Bill Phillips, Bruce Balmat, and Charles Yeung stated that:

"Support staff and other operators not required to be certified should be able to meet their obligations by participating in NERC continuing education."

"The industry needs a little more definition and clarity on who is the functional entity (IA, RA, PA, etc.)"

Response

The drafting team will focus the scope of this first version of the training standard to those operating personnel who *directly perform* the tasks critical to the reliable operation of the bulk electric system. NERC will identify those tasks in a JTA that it is conducting this spring with system operators, and we will list those tasks in the standard. These tasks will be those most likely performed by Reliability Coordinators, Balancing Authorities, and Transmission Operators. However, we do not want to assume that no other organizations perform any of these tasks. Therefore, the drafting team will continue to check all responsible entities on the standards authorization request, making it clear that only those organizations whose personnel perform one or more of the listed tasks must comply with the standard.

NERC will conduct future JTAs to identify the tasks that support and supervisory personnel perform with the idea of revising the training standard in the future to include these new tasks.

In regard to the relationship between training and certification, training is a broader issue than certification. Certification may require a minimal competency in knowledge across the broad spectrum of all system operators that perform for example, reliability tasks. Certification says nothing about performing specific tasks for a specific organization. Training, on the other hand, must at some point address organization-specific requirements to perform the tasks of a system reliability coordinator for that specific organization. The training standard does not address which operating personnel must be certified. Other standards contain those requirements. The question of which personnel should be certified will be re-examined by the Personnel Subcommittee upon completion of the Training Standard.

To address these comments, we need to look at the breadth and depth of the proposed standard.

Breadth. By *breadth*, we mean two things. First, the variety of responsible entities—Transmission Operators, Reliability Coordinators, Balancing Authorities and so on—to which the training standard applies. Second, we mean the population of operating personnel for which the training programs must be developed. For example, an RTO member who does not register as a Transmission Operator may instead see itself as only a Distribution Provider (DP) or Load-Serving Entity (LSE). If NERC does not include the DP and LSE in the training standard, there is no compelling reason for these organizations to utilize a systematic approach to training, even though their operating personnel may perform *tasks* that can affect the operations of the high-voltage transmission system. So unlike other NERC standards, the training standard cannot be limited to just those responsible entities that some may consider the more obvious candidates for operator training programs.

This also means that organizations that are transmission dependent and normally thought of as too small to require operator training may need training for their personnel who perform transmission operating tasks that can affect the bulk electric system. While the training requirements may be minimal, they are nonetheless important and NERC cannot overlook these organizations.

To this point, the training standard does not require an organization to have training staff, but rather utilize a systematic approach to training. This training program can be provided through vendors or even arrangements with other utilities who do have training staffs and programs of their own. It would be quite reasonable for operators at a smaller municipal or

cooperative utility that operates, say, a 230 kV switchyard to receive training from that utility's Transmission Operator neighbor that operates the rest of the system to which that switchyard is connected. As long as the smaller utility can demonstrate that it determined the tasks that its operators perform and that those operators were trained to those tasks, the utility can comply with the training standard.

Depth. As to the *depth* within an organization's management structure to which the training standard applies, this, too, will be revealed by the JTA. For example, the JTA will make quite clear the wide array of critical operating tasks that the operating personnel "on the desks" perform. And it is these tasks that must be covered in the organization's training if that training is to be relevant to the operators' competency.

On the other hand, the vice-president of operations, while certainly responsible for the reliable operations of the system, does not perform these operating tasks and would need little training in the details of breaker switching or reactive control.

Responses to Individual Comments

In this section we list our responses to each comment. For efficiency's sake, if the comment is one of the three General Comments discussed above, we noted that instead of simply repeating the same response.

1. Do you agree there is a reliability need for the proposed training standard?

| Commenter | Yes | No | Comment | Response |
|---|-----|----|--|--|
| Total | 19 | 0 | | |
| Anthony Giasi | X | | However, the training standard must be reasonable and explicit, it must be specific as to which personnel in each entity require training, it must be specific as to the different training protocols not only for the personnel within each entity, but also for the different entities, it must be achievable in a reasonable time frame for a reasonable cost, and not subject to compliance for a reasonable period of time, say three years to allow for formation and implementation. | <p>Please refer to our Responses to General Comments above.</p> <p>We are not sure how to judge "reasonable cost." Training costs should be a matter of the cost to operate competently. The revised SAR focuses all training requirements on the competency to operate. Reasonable cost to operate competently depends on the organization, its functions, the market, and many other factors. Training costs should be directly tied to what is required to operate competently, and the revised SAR stresses this in terms of performance requirements as the basis for training.</p> <p>The Standards Authorization Committee will determine if a field testing period is needed for implementation of the standard.</p> |
| Guy Zito Kathleen Goodman Ralph Rufrano Greg Campoli Pete Lebro Roger Champagne Khaqan Khan Al Adamsom David Kiguel Robert Pelligrini David Little Brian Hogue Jerry Mosier | X | | There needs to be the flexibility to tailor the training to the individual involved. Requirements should be limited to Certification Standards. NERC is being overly descriptive of "how to" conduct training rather than achieving specific results. NERC Standards should be "object oriented," that is, specify what the final requirements are. Prescribing how each entity goes about to achieve these objectives is beyond NERC's mandate. Limit this to only Control Room Operating staff that actually "operate" the system. | Please refer to our Response to General Comment 1 above. |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---------------|-----|----|--|--|
| James Stanton | X | | I believe there is a reliability need for a training standard, though not necessarily the one being proposed. | The drafting team welcomes specific recommendations. |
| John Neagle | X | | AECI agrees with the general concept of a training standard for the purpose of promoting reliability. The SAR does not contain sufficient detail to determine whether or not Associated would agree with a standard based on this SAR. | <p>Please refer to our Response to General Comment 3 above.</p> <p>The new SAR has considerably more detail than the initial SAR. We request that the commenter review the revised SAR and determine if it contains sufficient detail to resolve their concerns and comment accordingly.</p> |
| Karl Bryan | X | | I don't think you are going far enough with the requirement for training. I am constantly amazed at how generation operators do not understand where they fit into the big picture as far as system reliability issues are concerned. Even the little task of voltage support is poorly understood by our operators. | <p>Please refer to our Response to General Comment 3 above.</p> <p>We agree. The Personnel Subcommittee will be conducting another round of job and tasks analysis for personnel that support the reliability of the Bulk Electric System. Generator operators, though they do not operate the transmission component of the bulk electric system, can most definitely impact real-time reliability. This should be verified by the second round of job and task analysis to be completed in early summer, 2006. The training standard will be revised to include any additional tasks identified by the second round of studies to directly impact the reliability of the Bulk Electric System other than what has been traditionally considered system operators</p> |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---|-----------------|----|---|---|
| <p>Karl Tammar Dale McMaster Ed Riley Sam Jones Peter Henderson Peter Brandien Bill Phillips Bruce Balmat Charles Yeung Peter Henderson</p> | <p>X</p> | | <p>There is a need for a training standard and we applaud the intent. Such a standard should be the single location for all training requirements (presently training requirements are found in several locations) for the appropriate functions. However, the proposed standard appears to apply a "one size fits all" approach to every authority and function. If this is the case, then this approach is likely to be unrealistic. It should be clear as to which functions should be certified versus having taken accredited courses. Also, clarity is needed that there will be different types of certification rather than just NERC Operator Certification. NERC needs to better define the Scope of this standard. Is the intent of the standard to measure compliance of the training of (reliability entity) personnel regarding NERC Reliability Standards, or is the standard meant to measure compliance of all Training Programs? If the intent is the former, then the question is, is there enough material to really test?, since some of the NERC standards applying to owners for example only require communications of data. If the intent is the latter, then the question is, is NERC the right organization to evaluate in-house training programs? Given the diversity of operating approaches used in North America. In this case, some programs are probably better evaluated by those closer to the needs and responsibilities of the individual organization.</p> | <p>Please refer to our Response to General Comment 2 above.</p> <p>Also, the training standard is not a certification standard. Certification requirements are specified in other standards. That said, the certification requirements must consider the training provided to the system operators. That is, NERC cannot require operator certification for tasks that the operator does not perform. That's why the JTA plays a key role in both the training and certification programs. The Personnel Subcommittee has been tasked with examining which personnel must be certified. This will be addressed in 2006, after the training standard is completed. Refer to the General Comment 3 for the relationship of training to certification.</p> |
| <p>Kathleen Davis Jeff Newsome Rick King</p> | <p>X</p> | | <p>A training standard is needed to ensure we have competent personnel who can safely and reliably operate, maintain, and improve the performance of the electric power system. Training for the system operators is critical to the industry as a whole. We are at the beginning stages of where we must go in the future to reassure ourselves and the public at large that the events of August 14th 2003 will not be repeated. For the NERC organization this should be at a minimum, in it's top three priorities.</p> | <p>We agree.</p> |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---|-----|----|---|---|
| Theodore G. Pappas | X | | The training should be broken into three segments. The first should be certification training or that training needed to maintain certification. This would be applicable to the RA, BA, IA, Transmission Operator, and possibly the Market Operator In other words control room operator training. The second segment should be for those not directly involved in the operation of the power system. This would apply to the Planning Authority, Resource Planner, and Transmission Planner. The third segment should be for generator operators and would cover items such as interconnections, VAR flow, relaying, etc so that these operators can develop an understanding of the working of the power system and their impact on it. The standard should define the training subjects, total hours and, for continued education, the frequency. Flexibility is key so defining specific hours to each subject is not appropriate. | <p>Please refer to our Responses to General Comments above.</p> <p>We are having difficulty with the last two sentences in the comment. It says in effect, that the standard should specify training subjects, total hours, and frequency of training, yet be flexible by not specifying hours required for each subject. These appear to be conflicting statements so we do not know how to respond.</p> |
| Thomas Bradish | X | | If we do not develop a focused training standard, we are destined to repeat August 14. | That's why the training standard is so important. Please refer to our Responses to General Comments above. |
| Alan Gale | X | | Although the industry has survived without one for several years, the investigation of the August 14th blackout has pretty much dictated that this be yes. | |
| Mark Heimbach | X | | All real-time market participants must have some level of training dependent upon the potential effects they may have on system reliability. | Please refer to our Responses to General Comments above. |
| Howard Rulf | X | | No comment | |
| Ken Goldsmith | X | | No comment | |
| Gerald Rheault | X | | No comment | |
| Richard Kafka Michael Maher William Mitchell David Thorne Vic Davis Val Hildebrand | X | | No comment | |
| William Smith | X | | No comment | |
| Michael Calimano | X | | No comment | |
| Raj Rana | X | | No comment | |

2. Regarding the applicability of the SAR: Indicate which of the following you believe the proposed standard should apply:

Reliability Authority/Coordinator

- Balancing Authority
- Interchange Authority
- Planning Authority
- Resource Planner
- Transmission Service Provider
- Transmission Planner
- Transmission Owner
- Transmission Operator
- Distribution Provider
- Generator Owner
- Generator Operator
- Purchasing-Selling Entity
- Market Operator
- Load-Serving Entity

| Comment | Comment | Response |
|---|--|--|
| Anthony Giasi | All boxes checked except DP Do the proposed training standards apply to non-registered entities to whom actions or operations are delegated by a registered entity? If yes, why. If not, then do any training standards apply? | General response: The comments to this question do not show consensus. As we explain in our responses to the General Comments sections, this standard requires that all organizations determine for themselves if their operating personnel need training. |
| Guy Zito Kathleen Goodman Ralph Rufrano Greg Campoli Pete Lebro Roger Champagne Khaqan Khan Al Adamsom David Kiguel Robert Pelligrini David Little Brian Hogue Jerry Mosier | RC, BA, IA, TSP, TOP, GOP NPCC - believes that anyone engaged in direct operating/control activity for the Bulk Power System should be properly qualified/certified. An alternative approach to the above also discussed might also involve only requiring NERC Certifiable Functions i.e. Reliability Authority (RC), Balancing Authority, Interchange Authority, Transmission Operator to adhere to the resultant standard. | Also, • Please refer to our Responses to General Comments above. • Under the ERO, <i>all</i> bulk power system owners, operators, and users will need to register under one of the definitions of the functional model. The revised SAR does limit its scope to those system operators performing real-time tasks that directly impact the reliability of the Bulk Electric System. Support tasks and personnel will be addressed after some additional studies are completed. • Personnel directly responsible for operating the electric power system may reside in organizations other than just the RC, BA, and IA. That's why the scope of the proposed standard includes all responsible entities. However, we will contain the initial job and tasks analysis to those system operators who perform critical operating tasks. The proposed training standard does not include personnel certification requirements. This standard does not address NERC operator certification requirements. |
| James Stanton | No boxes checked The proposed Standard is overly broad and ambiguous, and should not uniformly apply to anyone | • Refer to the General Comment 3 for the relationship of training to certification. Generator operators, though they do not operate the transmission component of the bulk electric system, can most definitely impact real-time reliability. This should be verified by the second |

Consideration of Comments on First Draft of SAR for Personnel Training

| Comment | Comment | Response |
|---|--|--|
| John Neagle | <p>RC, BA, IA,</p> <p>AECI suggests it is inappropriate and unnecessary for a training standard resulting from this SAR to apply to electric utility industry individuals other than those directly responsible for the operation of the interconnected system, i.e. control center personnel.</p> | <p>round of job and task analysis to be completed in early summer, 2006. The training standard will be revised to include any additional tasks identified by the second round of studies to directly impact the reliability of the Bulk Electric System other than what has been traditionally considered system operators</p> |
| Karl Bryan | <p>RC, BA, IA, PA, RP, TSP, TP, TOP, DP, GOP, MO, LSE</p> <p>No other comments</p> | |
| <p>Karl Tammar</p> <p>Dale McMaster</p> <p>Ed Riley</p> <p>Sam Jones</p> <p>Peter Henderson</p> <p>Peter Brandien</p> <p>Bill Phillips</p> <p>Bruce Balmat</p> <p>Charles Yeung</p> | <p>RC, BA, TOP</p> <p>Support staff and other operators not required to be certified should be able to meet their obligations by participating in NERC continuing education.</p> <p>TSP is listed twice. Was there supposed to be some other entity?</p> <p>The industry needs a little more definition and clarity on who is the functional entity (IA, RA, PA, etc.)</p> | |
| <p>Kathleen Davis</p> <p>Jeff Newsome</p> <p>Rick King</p> | <p>RC, BA, IA, PA, TSP, TOP</p> <p>No other comments</p> | |
| Peter Henderson | <p>RC, BA, IA, TOP</p> <p>Where we indicated "No" above, does not imply that there should not be training. Support staff and other staff (PA, RP, TSP, GOP, etc) or operators not required to be certified should be able to meet their obligations by participating in NERC continuing education</p> <p>TSP is listed twice. Was there supposed to be some other entity or is it a duplication?</p> <p>The industry needs a little more definition and clarity on who is the functional entity (IA, RA, PA, etc.)</p> | |
| Theodore G. Pappas | <p>RC, BA, IA, PA, RP, TSP, TP, TOP, GOP, MO</p> <p>No other comments</p> | |
| Thomas Bradish | <p>All boxes checked, I have checked all of the above because all will need to have some level of knowledge around the operation of the grid. The key phrase is "some level of knowledge". A one size fits all approach would be over kill and doomed to failure. The training requirements should fit the knowledge requirement of the position.</p> | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Comment | Comment | Response |
|---|--|----------|
| Alan Gale | RC, BA, IA, PA, TSP, TOP, GOP, PSE, MO, LSE No other comments | |
| Mark Heimbach | RC, BA, IA, TSP, TO, TOP, DP, GOP, GO, PSE, MO, LSE It should apply to all entities that can affect real-time operations. However, the training requirements for each entity should be different dependent on the way they can affect the system. | |
| Howard Rulf | RC, BA, IA, PA, TSP, TOP, GOP, PSE, MO, LSE No other comments | |
| Ken Goldsmith | RC, BA, IA, TSP, TOP, No other comments | |
| Gerald Rheault | RC, BA, IA, RP, TSP, TP, TOP, DP, GOP, LSE For the Generator Operator category, Manitoba Hydro believes that this Standard should apply for a generator operator at the generation company operations or dispatch center but not to an operator at the thermal or hydraulic plant | |
| Richard Kafka Michael Maher William Mitchell David Thorne Vic Davis Val Hildebrand | BA, IA, PA, TSP, TOP, GOP, PSE, MO, LSE Those entities operating in real time should have training requirements. | |
| William Smith | RC, BA, IA, PA, TSP, TOP, GOP, PSE, MO, LSE No other comments | |
| Michael Calimano | RC, BA, IA, TOP The standard should be initially developed to support only those personnel who are required to be NERC certified. Once the standards have been established and fully implemented at that level, expansion of the target audience should be examined. | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Comment | Comment | Response |
|----------|---|----------|
| Raj Rana | <p>RC, BA, IA, PA, TOP</p> <p>There should be a baseline competency for each Functional model entity listed above. However, recognizing that the baseline competency varies by entity class, therefore it can't be a "one size fits all" concept. The Standard should consider this factor and be flexible to the varying needs of the intended entity class.</p> <p>The training needs and requirements for a RA/RC and TOP differ from that of a BA or IA. The standard should be clear on that point and have different requirements for each of the entities. An IA should not have to have staff with the same knowledge and expertise as a RA/RC.</p> <p>The Standard should only include the entities checked above. Additionally, the Standard should not cover management.</p> | |

3. Do you believe the content as outlined in the Standard Authorization Request is adequate?

Q1. Are there additional elements that should be included in this proposed standard?

Q2. Are there existing elements that should be excluded in this proposal?

Drafting Team General Response to Question 3:

The Drafting Team understands that the types of continuous training listed in the SAR were only examples of training that an organization could provide. However, other types of training, such as cross training, could come under the title of other training. Again, the intent is to use a systematic approach in developing all types of training that would be provided.

The overall goal of the training standard will be to provide guidance in how each entity will determine what training is needed for its staff based on performance requirements, some valid method for determining if a competency gap exists, and delivering training that corrects the competency gap. Those competency gaps should be identified on several levels, for example from new employee up through a master operator level. Various types of training appropriate for the situation, but meeting the standard for effective training can then address the gaps. That standard for effective training is the objective of the drafting team.

To help the industry identify critical operating tasks, the NERC Personnel Subcommittee is conducting several studies to determine the competencies of excellent operators, the tasks done by operating personnel that directly impact reliability, and tasks performed by support personnel that directly impact reliability. The first two studies will be completed and the results factored into the initial training standard. The study of support personnel tasks will be included in a revision to the training standard at a later date. Organizations may use these NERC conducted JTAs to identify those operating personnel who must be included in their training program, but they must conduct a training needs assessment to determine the specific training needs of their personnel.

To clarify our intent, it was not to quantify the elements of a training program, but to develop a process that considers key elements of a good training program. (Item 1)

| Commenter | Yes | No | Comment | Response |
|-----------|-----|----|---------|----------|
| Total | | | | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---------------|-----------|----|--|---|
| Anthony Giasi | XX | | <p>Yes to Q1 and Q2. Qualification testing; Real-time assessments to verify training carried over to the job; Missing the link to competency of existing system operators; Needs to identify the qualifications for the system operator to first sit in the chair; Needs to address resources needed to accomplish the training; Need a training shift for system operators (adequate time dedicated to training)</p> <p>Companies should have plans in place to take a system operator from an initial competency level up to an expert level, however this is not NERC's responsibility.</p> <p>What is written is 'process-oriented' and is not sufficient in detail for all system personnel positions – the scope is too broad (covering too many positions) and the level is too high level (doesn't identify what positions are included in the category called 'system personnel')– a SAR targeted for the individual types of positions (such as a SAR just for the operating authority positions) would be more helpful.</p> | <p>Please refer to our Responses to General Comments above.</p> <p>Qualification training and testing will need to adhere to the same process as any other type of training which is based on an analysis of needs conducted by the employer. The resources will be determined by this same needs analysis.</p> <p>Several changes / additions to the SAR have been made to base training on performance requirements. Performance capability (competency) does not have to, in most cases, be verified on live systems to validate competency. The SAR has been changed to extensively address On-the-Job-Training</p> <p>The approach of focusing on the training process will achieve the most detail you can get, if done correctly. Following a valid process for training is how you get down to the specific requirements for a specific task. The emphasis is on tasks, not job positions because those will vary in the tasks they do from organization to organization. The Job and Task Analysis being conducted by the Personnel Subcommittee will identify many of the jobs performing operating tasks that directly impact reliability, but it will not identify all of them. The performance of tasks impact reliability, not a person's job title.</p> <p>Initial training and testing will need to adhere to the same process as any other type of training which is based on an analysis of needs conducted by the employer.</p> <p>The final standard will address the recommendations of the blackout investigation with respect to who should be trained. The scope of this standard must address all that can impact the reliability of the bulk electrical system.</p> |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---|-----|----|---|--|
| Guy Zito Kathleen Goodman Ralph Rufrano Greg Campoli Pete Lebro Roger Champagne Khaqan Khan Al Adamsom David Kiguel Robert Pelligrini David Little Brian Hogue Jerry Mosier | X | X | Yes to Q1 and No to Q2. Certification is a control room operator issue. | This standard is not intended to prescribe which personnel should be certified. This standard does not address NERC operator certification requirements. |
| James Stanton | | X | No to Q1 and no check for Q2. The content is inadequate not because of a lack of elements but because of the ambiguity of what it is intended to do. A Training Standard cannot be a "one size fits all" approach for functions as disparate as Reliability Authorities and Purchasing and Selling entities. | Please refer to our Responses to General Comments above as well as the revised SAR and the draft training standard that accompanies the SAR. |
| John Neagle | X | X | No to Q1 and Yes to Q2. Associated Electric Cooperative Inc. suggests a training standard should address the desired outcomes and should not specify the methods to achieve those outcomes. The SAR does not contain sufficient detail to determine the SAR drafting team's intent, but it appears the resulting standard would be quite prescriptive in many areas. Any elements currently included in the SAR that prescribe facilities, tools, materials, funding, staffing levels, methods, etc. should be deleted. These details are best determined by and should be left to the discretion of the individual company. | Please refer to our Responses to General Comments above. |
| Karl Bryan | X | | Yes to Q2, no check for Q2. I feel that various levels of certification should be developed, similar to engineer in training to registered professional engineer. | <ul style="list-style-type: none"> The proposed training standard does not include personnel certification requirements. This standard does not address NERC operator certification requirements. |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|--|-----------|----------|---|---|
| Karl Tammar Dale McMaster Ed Riley Sam Jones Peter Henderson Peter Brandien Bill Phillips Bruce Balmat Charles Yeung | XX | X | <p>Yes and No to Q1, Yes to Q2.</p> <p>There are two conflicting questions. The training program requirements are more than adequate (and may not be necessary for some training programs).</p> <p>Again, the one size fits all causes problems. What type of emergency (or situational awareness or simulator) training should PSE, IA or Planning Authority participate? As another example, why do all these entities need to perform independent JTAs when it's likely something will need to be created at the NERC level to review the JTAs (unless the intent is to check compliance by seeing if there is a document called "JTA" as opposed to a thoughtful analysis).</p> | <p>Please refer to our Responses to General Comments above and the text box "Determining Tasks."</p> |
| Kathleen Davis Jeff Newsome Rick King | XX | | <p>Yes to Q1 and Q2. One basic tenet or requirement that should be stated is the use of a systematic approach (SAT), based on job performance requirements, to guide the training of system personnel.</p> | <p>We agree and have included language to that effect.</p> |
| | | | <p>You should not specify job and task analysis under 1.b. A needs assessment can be satisfied in several ways from a simple needs or job analysis up to a full blown job and task analysis.</p> | <p>We agree regarding the JTA, and have changed the language to needs analysis or assessment.</p> |
| | | | <p>There should only be a requirement for documentation and record keeping under 1.i. Administration. A learning management system is one means to document and track training.</p> | <p>We agree with the documentation comment and have changed the language to reflect simply documentation and record keeping</p> |
| | | | <p>If hours are specified under initial training requirements they should reflect only the minimum acceptable number of hours for training. If a company does a needs analysis to determine job requirements the time to conduct the initial training program will vary based on the components of the job and the necessary elements to be trained on.</p> | <p>We agree and have modified the SAR to reflect this.</p> |
| | | | <p>Progression training and cross training are not consistent with the intent of a continuing training program. A continuing training program is intended to refresh and improve the application of knowledge and job-related skills for the job the trainee works or is qualified to work.</p> | <p>We agree and have modified the SAR to reflect this.</p> |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|--------------------|-----------|-----------|---|--|
| | | | Simulation training is a platform or method to provide initial and continuing training. I don't feel that it should be addressed separately. | We agree and have modified the SAR to reflect the intent that any method of training delivery needs to be part of the training development process. |
| Peter Henderson | XX | X | <p>Yes and no to Q1 and yes to Q2.</p> <p>There are two conflicting questions. The training program requirements are more than adequate (and may not be necessary for some training programs).</p> <p>Again, if the approach is "one size fits all," this will cause problems. What type of emergency (or situational awareness, or simulator) training should PSE, IA or PA participate in?</p> <p>On the other hand, if the intention is to have different courses/certification streamlined for each involved function, then we can understand the approach. However, not all of the functions listed in Q2 should be part of this standard. See comments on Q2.</p> | <p>Please refer to our Responses to General Comments above.</p> <p>There may, however, be some specific requirements for system operators based on information gained through the NERC System Operator Study currently being conducted.</p> |
| Theodore G. Pappas | X | X | <p>No to Q1 and Yes to Q2.</p> <p>Much of the training is inappropriate for people not directly involved in operations or planning such as certain levels of management or support staff.</p> <p>The training program should not be so rigid that a training group is required. Senior staff should be capable of providing the training.</p> | <p>Please refer to our Responses to General Comment 3 above.</p> <p>NERC will consider training for management and support staff at a later time.</p> <p>It is not the Drafting Team's intent to define the resources, such as instructors, facilities, and funding. It is the drafting team's intent, however, that certain practices, such as having an operator come to training after working a full shift, is not even a minimally acceptable training process.</p> |
| Thomas Bradish | | XX | No to both Q1 and Q2 with no comments | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---------------|-----|----|--|---|
| Alan Gale | X | X | <p>No to Q1 and Yes to Q2.</p> <p>Certification Preparation - Each candidate must prepare for the exam and the measure is passing the test. A formal program to say what needs to be trained on before you can take the test is unnecessary. Would this preclude an individual from taking the test on his own, being hired, and then be non-compliant because he did not complete the "certification preparation" training but yet is certified?</p> <p>Progression Training - The training requirements for a company to advance an employee should be dictated by that company. The reliability of the grid should address the position, not the advancement to that position. If the "higher" position has additional training requirements, address those requirements, not what is needed to move up to that position.</p> <p>LMS - What is this intended to be? I do not recall seeing this in a list of definitions. Is this a "buzz word" that a particular vendor uses in describing their system? What would be in it that would not fall under Documentation or Record Retention?</p> <p>Number of hours - This contradicts the "Competency-based" objectives. Is the goal competent operators or having enough hours. You can have one with or without the other. Since this SAR does not address CEH's or Certification maintenance a specific number of hours would be easier to budget for, but may not yield the intended reliable operations.</p> <p>Advanced system operations training - How advanced is this intended to be? How much greater than basic? How much more "reliable" than "reliable"? The Detailed Description states "The goal would be to promote the reliability of the Interconnection through the setting of appropriate MINIMUM training requirements for system personnel." Having advanced training sounds like more than the minimum requirements.</p> | <p>First, please refer to our Responses to General Comments above. We have rewritten the SAR and standard to address these comments.</p> <p>Also, the proposed training standard does not include personnel certification requirements.</p> <p>Regarding progression training, it has been taken out of the standard The training process does apply to it just like any other training, but specific reference to it has been removed.</p> <p>LMS is a Learning Management System. Reference to LMS has been removed.</p> <p>We agree about the number of hours. The only reference made in the revised SAR is to a specific number of hours for emergency operations training. We have left that requirement as is because at present, we do not have another number of hours that we can validate, but will include that as an item in future Personnel Subcommittee study.</p> <p>Advance training was meant to refer to continuing education. We have changed the wording accordingly.</p> |
| Mark Heimbach | | XX | No for both Q1 and Q2 with no comments. | |
| Howard Rulf | | XX | No for both Q1 and Q2 with no comments. | |
| Ken Goldsmith | | XX | No for both Q1 and Q2 with no comments. | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---|------------|-----------|--|--|
| Gerald Rheault | | XX | No for both Q1 and Q2 with no comments. | |
| Richard Kafka Michael Maher William Mitchell David Thorne Vic Davis Val Hildebrand | XX | | Yes for both Q1 and Q2 Under Item 1, i. Administration, a Learning Management System is a "how" rather than a "what" and should be eliminated. Item 3, Continuous training requirements, is poorly defined. It mixes topics, categories and methods of training, and many are subsets of others. The list is not properly defined or organized. Item 4, Simulation training: Should identify types, but not prescribe any specific method of simulation or simulator. Item 7, Training resources and staff, f. Funding: funding should not be part of the standard. | The SAR drafting team agrees and the SAR has been rewritten to address these concerns |
| William Smith | X | X | No to Q1 and yes to Q2. In item 3 - Continuous training requirements (topics and hours), parts b. Progression training and c. Cross training goes beyond training requirements. These two parts could infringe on Corporate Policy. Part i. Team training should be a desire or suggestion rather than a requirement. In item 1, part c should be excluded since it is just the physical representation of parts a and b. Parts f, g, h, and j should be included in 3.a. as part of the Annual training requirements. | The SAR drafting team agrees and the SAR has been rewritten to address these concerns. |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|------------------|----------|----------|---|---|
| Michael Calimano | X | X | <p>No to Q1 and Yes to Q2.</p> <p>Several items need clarification:</p> <p>The distinction between job related OJT, Cross training, and progression training.</p> <p>The distinctions between situational awareness and system awareness.</p> <p>The distinction between "learning management system" and Training Plan/Training Schedule/Progress Assessment/Documentation/Record Retention.</p> <p>Item 7f should be deleted as redundant. It is included in 6 and 7 a-c.</p> <p>Item 8b should be deleted as redundant. It is part of 8a.</p> <p>It would make more sense to more explicitly link item 1f "program design" with item 8a "Adheres to the NERC Continuing Education program criteria."</p> | <p>The SAR drafting team agrees and the SAR has been rewritten to address these concerns.</p> |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|-----------|-----------|----|--|--|
| Raj Rana | XX | | <p>Yes to both Q1 and Q2.</p> <p>The Standard needs to define the baseline competencies of the training program individually for each Functional model entity listed above, as they have different needs and requirements. Also, the Standard needs to define the essential elements of a training program individually for the RA/RC, BA, IA, and TOP, as they each have different needs and requirements.</p> <p>5.a.i: The Standard should target just the RA/RC, BA, IA, and TOP and their support staff. The standard should not apply to all functional entities in the Functional Model nor to management.</p> <p>6.a and 6.b: Delete all of 6.a and 6.b. The Standard should not dictate staffing levels. This is a business decision. The standard may influence staffing levels via the requirement for the amount of annual training, which is OK, but it should not dictate staffing levels by saying you need x staff for a system operator shift, etc. An entity may need no training staff if they decide to outsource 100% of their training needs.</p> <p>7.a: Facilities. We question the wisdom of a NERC Standard dictating facility requirements for training, other than to state that adequate facilities need to be provided. Depending upon how an entity decides to provide the required training, they may not need much in the way of physical training facilities, i.e. if they decide to outsource all their training and send their staff to a vendor's training facilities. We would agree that it is appropriate for inclusion in a Standard to specify some boundaries/requirements in regard to how training should be facilitated or proctored, but we are not sure if that is what is meant by this bullet point on "Facilities."</p> <p>7.f: Delete Funding. It is inappropriate for a NERC Reliability Standard to dictate a certain level of funding. Funding is not a proper measure of a Standard, performance is.</p> | <p>Please refer to our Responses to General Comments above.</p> <p>In regard to the applicability of the standard, the revised SAR does limit its scope to those system operators performing real-time tasks that directly impact the reliability of the Bulk Electric System. Support tasks and personnel will be addressed after some additional studies are completed. We have left several functional entities checked in the SAR because we do not have the results of the JTA that will identify who is performing those real-time operating tasks that directly impact reliability.</p> <p>Also, the revised SAR and standard do not specify staffing levels, facilities, or funding requirements. We agree that the organization must determine these as it sees fit to develop its training program and ensure that it provides adequate time for training.</p> |

4. Do you believe there are any regional differences that should exist in the proposed standard?

Drafting Team General Response to Question 4:

Regional differences can be addressed by a standard that requires those differences to be a part of the local training program. Again, the Standard will establish the requirements for what is considered an acceptable training program in our industry. The type and format of training is then part of the process of designing training for a particular target audience on a particular level of competency on a particular level of organizational specificity.

| Commenter | Yes | No | Comment | Response |
|-------------------|----------|-----------|--|---|
| Total | 3 | 16 | | |
| Anthony Giasi | | X | No comments | <p>The drafting team generally agrees with these comments. As we explain in our responses to the three General Comments, every organization will need to determine its own training needs based on the tasks its personnel perform.</p> <p>The NERC standard does not preclude additional training required by the Regional Council, RTO or ISO, or the individual organization.</p> <p>Finally, this standard does not include certification requirements.</p> |
| Guy Zito | | X | No comments | |
| Kathleen Goodman | | | | |
| Ralph Rufrano | | | | |
| Greg Campoli | | | | |
| Pete Lebro | | | | |
| Roger Champagne | | | | |
| Khaqan Khan | | | | |
| Al Adamsom | | | | |
| David Kiguel | | | | |
| Robert Pelligrini | | | | |
| David Little | | | | |
| Brian Hogue | | | | |
| Jerry Mosier | | | | |
| James Stanton | X | | ERCOT's system, for example, does not easily fit into the NERC proposed functional model and the training standard should recognize the unique regional differences found in the ERCOT Region. | |
| John Neagle | | X | Given the limited detail in the SAR, Associated Electric Cooperative Inc. does not see a need for regional differences. | |
| Karl Bryan | | X | In order for national certification to mean anything, there should be no region specific differences for earning certification. | This standard does not address NERC operator certification requirements. |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|--|-----|----|--|--|
| Karl Tammar Dale McMaster Ed Riley Sam Jones Peter Henderson Peter Brandien Bill Phillips Bruce Balmat Charles Yeung | | X | There will be site-to-site differences. There would be some regional differences in content and topics, but there should be no regional differences in general training requirements. Some of the NERC functional definitions need more details (who is the TO, IA, RA, etc.). | The drafting team generally agrees with these comments. As we explain in our responses to the three General Comments, every organization will need to determine its own training needs based on the tasks its personnel perform. |
| Kathleen Davis Jeff Newsome Rick King | X | | From an overall framework, the standard should be the same however we must recognize the special needs and the special circumstance of individual regions. One size does not always fit all. | We agree. That is why the approach to the standard will be to require a systematic approach to training. The standard will be focused on following a valid process, but every organization will need to determine its own training needs based on the tasks its personnel perform. |
| Peter Henderson | | X | There will be site-to-site differences. There would be some regional differences in content and topics, but there should be no regional differences in general training requirements. Some of the NERC functional definitions need more detail (who is the transmission operator, interchange authority, reliability authority, etc.). | We agree. |
| Theodore G. Pappas | | X | No Comments | |
| Thomas Bradish | | X | I believe that regional differences should be handled in the content and design of the entities training program. | We agree. |
| Alan Gale | | X | Minimum standards should be minimum standards. If a region needs something beyond that, it should become a regional requirement. | We agree. |
| Mark Heimbach | X | | My perspective is one of a Generator Operator, which operates in four different Reliability Councils (centralized dispatch generation control center with control of multiple generation assets in multiple regions). Each Council has unique differences that must be accommodated. | We agree. That is why the approach to the standard will be to require a systematic approach to training. The standard will be focused on following a valid process, but every organization will need to determine its own training needs based on the tasks its personnel perform. |
| Howard Rulf | | X | No Comments | |
| Ken Goldsmith | | X | No Comments | |
| Gerald Rheault | | X | No Comments | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---|-----|----|---|---|
| Richard Kafka Michael Maher William Mitchell David Thorne Vic Davis Val Hildebrand | | X | No Comments | |
| William Smith | | X | No Comments | |
| Michael Calimano | | X | No Comments | |
| Raj Rana | | X | <p>However, some of the Regions and RTOs have separate training requirements for their members, which may or may not go beyond those proposed by this Standard. It is our belief that Regions and/or RTOs should be allowed to have more stringent requirements if they so choose, but should not be allowed or granted exceptions from this proposed NERC Standard if they desire weaker requirements. Further, we encourage the Regions and RTOs that have additional training requirements, to structure their requirements such that credit hours counted towards meeting their requirements could also count toward meeting the proposed NERC Standard requirements. However, we would be opposed to diluting the proposed NERC Standard in order to meet a Region's or RTO's lesser requirements. To clarify by example, if the proposed NERC Standard required 32 hours of emergency training and a Region or RTO required their members to have 50 hours of emergency training, we would want the Region and RTO to structure their requirements such that once completing the Region/RTO's 50 hours of emergency training, that 32 hours of that training also met the requirements of the proposed NERC Standard regarding emergency training. That is, the method of determining what is required in order to officially count an hour as a credit towards meeting the Region/RTO requirement needs to be at least as strict as the NERC requirement for what counts as an hour of training.</p> | |
| | | | | |
| | | | | <p>We agree. All types of training will need to follow the proposed standard process and meet the same requirements. Regional specific or company specific training requirements should be developed as per the standard and would thus meet both requirements simultaneously</p> |

5. Do you believe it is practical to implement the proposed standard with the existing staffing levels?

Drafting Team General Response to Question 5

This question was designed to garner the opinions of the respondents based on 1.) their current staffing levels, 2.) their understanding of the SAR, and 3.) their estimate of how many personnel they would need to add.

The drafting team does not intend to take issue with any of these opinions. Indeed, the actual requirements for both operating and training staff will depend on many factors, most notably the number and types of tasks that the operating personnel perform. Organizations will need to conduct some type of job and task analysis to identify those tasks (or use the one completed by the Personnel Subcommittee and included in the Training Standard, followed by a training needs assessment), and only then will they know what kind of staff, and how many are needed.

The training standard will not define staffing levels. Rather, it will define a training process that you would use to determine what staffing levels are required to support good training practices. If a well-defined process of developing training is used, as intended by this standard, each organization would use a systematic process to determine what training is needed, how it should be delivered, and what staff levels may be required to support training adequately.

With regard to justifying any additional resources your organization might need to conduct effective training, if your organization currently provides valid training that is needed to perform the jobs that may impact the reliability of the bulk electrical system, and can demonstrate that, then you would probably meet the proposed standard. If, however, you are not providing training for your system operators then the fact that you have not experienced a blackout to date is not a reliable indicator that your personnel are adequately trained.

The drafting team intends this general response to apply to all of the comments that follow. In most cases we have nothing more to add, and so we've left the response blank rather than just copy the same text repeatedly. We did respond to some comments for which this general response does not apply.

| Commenter | Yes | No | Comment | Response |
|-----------|-----|----|---------|----------|
| Total | 3 | 14 | | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---|-----|----|--|---|
| Anthony Giasi | | | A reasonable standard is needed, however, additional training personnel, training infrastructure, training documentation, training funding, etc would be required to train all "system personnel" as indicated in the SAR. | The revised SAR and standard do not specify staffing levels, facilities, or funding requirements. We agree that the organization must determine these as it sees fit to develop its training program and ensure that it provides adequate time for training. Also, the revised SAR does limit its scope to those system operators performing real-time tasks that directly impact the reliability of the Bulk Electric System. Support tasks and personnel will be addressed after some additional studies are completed. |
| Guy Zito Kathleen Goodman Ralph Rufrano Greg Campoli Pete Lebro Roger Champagne Khaqan Khan Al Adamsom David Kiguel Robert Pelligrini David Little Brian Hogue Jerry Mosier | | | Administrative duties related to audit. Additional Operating Room personnel due to out of control room activities. | The revised SAR and standard do not specify staffing levels, facilities, or funding requirements. |
| James Stanton | | | It might be doable if as many control areas as possible were consolidated, which would mean fewer people to train. If existing control areas continue to exist in their current number, then no, a training standard could not be implemented at current staffing levels. | |
| John Neagle | | | Associated Electric Cooperative Inc. responds to this question with a qualified no. As stated above, the SAR does not contain sufficient detail to positively determine required staffing. If the standard developed from this SAR is applicable to all the entities indicated on Page SAR-2, a 15 - 20% staff increase in affected areas could conceivably be necessary for Associated Electric Cooperative Inc. to comply. It is unlikely Associated's customers would appreciate or understand rate increases to fund such a training program that would do nothing to decrease the number of blackouts they have experienced (0). | The revised SAR and standard do not specify staffing levels, facilities, or funding requirements. We agree that the organization must determine these as it sees fit to develop its training program and ensure that it provides adequate time for training. Also, the revised SAR does limit its applicability to those system operators performing real-time tasks that directly impact the reliability of the Bulk Electric System. Support tasks and personnel will be addressed after some additional studies are completed. |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|--|-----|----|---|----------|
| Karl Bryan | | | It takes manpower off of the workbench in order to go through a certification training process. I would suspect that there will be some staff that require more remedial training than others. With the present shortage of staff at most facilities, it will be difficult to accomplish all of the required training in a timely manner without increasing staffing. | |
| Karl Tammar Dale McMaster Ed Riley Sam Jones Peter Henderson Peter Brandien Bill Phillips Bruce Balmat Charles Yeung | | | Each location would have different requirements. In general, there would likely be an additional person needed for every 5-10 people subject to this standard (to maintain the program, coordination training and provide relief for workers to participate in training, etc.). In addition, each organization subject to this standard would need a person for each occupation (for perhaps a year) to develop the program and get it started. A simulator requirement would add workload (setup, maintenance and running scenarios). | |
| Kathleen Davis Jeff Newsome Rick King | | | When you consider the additional training requirements that will probably come out of the standard I foresee a need for additional staffing in both the system personnel side of the business and on the training side of the business. We need an industry standard for staffing levels that applies across the board for the functional responsibility. It would be prudent to develop a training standard that stipulates the minimum requirements to satisfy training for system personnel, versus taking the approach to identify the best approach. This will minimize the impact on the staffing levels for both training and staff personnel. | |
| Peter Henderson | | | Each organization would have different requirements. In general, there would likely be additional staff required in many of the organizations to meet this standard (to maintain the program, to coordinate training, and to provide relief for staff to participate in training, etc.) In addition, each organization, subject to this standard, would incur start-up costs associated with developing the process. A simulator requirement would add workload (setup, maintenance and running scenarios), etc. The extent of increased resources cannot be determined until the details of the standard are available. | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
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| Theodore G. Pappas | | | The response depends on the final product. If it is a very formal and rigid plan, similar to the nuclear industry, additional staff will be required. | |
| Thomas Bradish | | | My guess is that it will increase our staffing requirement in order to send dispatchers to training. It will certainly mean additional record keeping. | |
| Alan Gale | | | <p>We anticipate that at least 2 additional "trainers" will be needed. In addition to the additional work load to support the training, and the research, and the administration required to become a NERC Certified CEH provider, the qualifications of these personnel is not yet known. There is no clarification as to what "competent in both knowledge of the subject and instructional capabilities" really means. These words seem to lead to the conclusion that we will have to hire outside agencies of ex-utility workers that have become trainers.</p> <p>Additional System Operators will be needed to adequately support the targeted hours and still be able to cover minimum vacation and sick time.</p> <p>Additional trainers and Operators will be needed each year to satisfy Item 6 "Staffing level adequacy needed to improve the quality and quantity of training." This statement also seems to go beyond the goal of setting minimum standards. It also goes beyond the Purpose/Industry need of "adequate". We will need more and more every year.</p> | |
| Mark Heimbach | | | I have no training staff so it would be impossible to design/implement formal training just for my group without additional staffing/expenditures. However, we do participate in all "pool wide" system operator training that is offered in MAAC and MAIN (via PJM) and applicable to Generation Operators. This is the type of training I would depend on to meet the requirements. | |
| Howard Rulf | | | No comments | |
| Ken Goldsmith | | | I believe it will require more personnel dedicated for the training function alone, which may be difficult for the smaller organizations. | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|---|-----|----|--|----------|
| Gerald Rheault | | | <p>Manitoba Hydro foresees requiring at least 2 additional staff; one administrative representative to help maintain the documentation and for record keeping and at least one instructional designer to create/revise the training courses. This is an estimate only and is based on a control centre perspective only. The total impact on Manitoba Hydro may be more extensive depending on the finalized training requirements and what options exist to develop and target the requisite training.</p> <p>Program planning and training development is both time and staff intensive. Manitoba Hydro currently has difficulty maintaining its trainee program and ongoing staff training with the existing staff. Additional staff will be required to implement any new requirements to the existing training program.</p> | |
| Richard Kafka Michael Maher William Mitchell David Thorne Vic Davis Val Hildebrand | | | <p>At a minimum, we would need additional training personnel. It is also possible that training requirements would be so great as to require additional operating personnel</p> | |
| William Smith | | | <p>Staffing levels cannot be predicted until the requirements are specified. If this proposed standard mandates the hours required, this question can't be answered until we know the required hours.</p> | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
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| Michael Calimano | | | <p>In the case of most organizations there will be a substantial operating staff increase required to provide operators with sufficient training time (6 crew shift rotations in place of 4 and 5 crew shift rotations). There will be an almost universal need to create or increase the size of training staffs to conduct continual Job Task Analysis, develop training modules for all tasks, continually validate and verify of individual training modules, and maintain of the "learning management system" (training plans/training schedules/progress assessment/documentation/records retention - all on an individual basis).</p> <p>This standard is being created to rectify the absence of existing staff levels sufficient to meet the in the training needs of system operators. If there were sufficient staffing, there would not be need for this standard.</p> <p>Operating or training staffing levels should be dictated as part of the standard.</p> <p>The individual entity should have the flexibility to determine the most effective mechanism to meet their particular training needs. Face-to-face training options require different staffing levels than a full e-learning approach.</p> | |

6. How and how often should training programs be reviewed for compliance with the standard?

Drafting Team Response to Question 6:

The industry recognized the need for auditing. Although the response is not unanimous, it does indicate a majority opinion with which the Drafting Team agrees. We have an existing compliance program that should be used to audit compliance with this standard just as we do with other NERC standards.

| Commenter | Yes | No | Comment | Response |
|---|-----|----|---|----------|
| Total | | | | |
| Anthony Giasi | | | Bi-annual basis. | |
| Guy Zito Kathleen Goodman Ralph Rufrano Greg Campoli Pete Lebro Roger Champagne Khaqan Khan Al Adamsom David Kiguel Robert Pelligrini David Little Brian Hogue Jerry Mosier | | | NPCC believes the training programs should be reviewed internally and self certified for compliance as required or at least yearly, with audits being conducted at least once every three years. | |
| James Stanton | | | The training program should be reviewed often enough to insure it remains aligned with current markets /regional design and adjust, if needed, to capture future market and reliability training needs. | |
| John Neagle | | | Associated Electric Cooperative Inc. suggests an annual self-certification to the appropriate Regional Reliability Council. | |
| Karl Bryan | | | The training programs should be accredited in the same manner and frequency as utilized in higher education. Nationally recognized auditing and once every 4 or 5 year recertification. | |
| Karl Tammar Dale McMaster Ed Riley | | | Every 3-5 years as part of normal compliance review. The organization's ability to meet the other NERC standards is a measure of the success of their | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
|--|-----|----|---|----------|
| Sam Jones Peter Henderson Peter Brandien Bill Phillips Bruce Balmat Charles Yeung | | | training program. | |
| Kathleen Davis Jeff Newsome Rick King | | | A mandatory compliance type review should be conducted every 4 years. This approach is consistent with similar utility training requirements. Each utility/entity should conduct self assessments on a more frequent time frame. This approach will minimize the impact on NERC and the industry when trying to audit training for compliance. | |
| Peter Henderson | | | The training programs should be reviewed internally and self certified for compliance as required or at least yearly, with audits being conducted at least once every three years. | |
| Theodore G. Pappas | | | The program should be self certified for compliance with audits on a biannual basis. | |
| Thomas Bradish | | | Can this reporting be handled similar to the CEU tracking for NERC certification? It will have to be tracked annually since most of the requirements will be annual requirements. | |
| Alan Gale | | | Reviews should be consistent with other standards. | |
| Mark Heimbach | | | Every five years. | |
| Howard Rulf | | | Every three years. | |
| Ken Goldsmith | | | No Comment | |
| Gerald Rheault | | | Each entity training program should be reviewed as part of the entity operational audit which is presently part of the NERC Compliance program. In the MAPP /MRO region this presently occurs every three years. Any program which was judged satisfactory at the last operational audit should not deteriorate to such a degree that the system is a threat to reliability in any three year window. | |

Consideration of Comments on First Draft of SAR for Personnel Training

| Commenter | Yes | No | Comment | Response |
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| Richard Kafka Michael Maher William Mitchell David Thorne Vic Davis Val Hildebrand | | | Self report via comprehensive questionnaire annually or every two years. Training audit team visit every 5 years. | |
| William Smith | | | Training Programs should be reviewed annually by the responsible staff. Entities should be required to Self-Certify annually. Every two to three years, the entity should undergo an on-site audit. | |
| Michael Calimano | | | Full training audit compliance should be included in the normal sequence of NERC functional organization audits. Compliance should be phased in due to the magnitude of the staffing and program development needs. | |
| Raj Rana | | | It should be similar to policies today. Specifically, annual self-certification and then as part of onsite audits every three years. | |

7. Please enter any additional comments you have regarding the proposed SAR.

Drafting team response to Question 7:

The current NERC Continuing Education (CE) program is just one model that can be used to qualify good training activities. It is not the intent of this standard that all training must be NERC CE-approved training.

The intent of this standard is not to develop a “one-size fits all” program.

However, the standard should address a generic process that fits various functional entities. We, as an industry, have nothing in place to say that it is critical to train personnel that operate the bulk electrical system by defining what valid training is. This standard must establish a baseline for training validity. We have seen repeatedly that when we, as an industry do not train; we do have operating failures that impact our constituency. Entities that are doing valid training will likely not be impacted significantly by the standard. However, we as an industry have repeatedly taken the stand that we can and should regulate ourselves. If we do not have standards for valid training, we have not regulated ourselves.

The results of the system operator training study being conducted by NERC may well determine more specific requirements for system operating personnel.

| Commenter | Yes | No | Comment | Response |
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| Total | | | | |
| Anthony Giasi | | | Match the definitions on the SAR with the definitions in the Glossary posted with Version 0. The standard needs to be written so the rules are objective, clear and well-understood by all end-users as well as auditors; Need to define what is meant by 'system personnel'; Need to define terms used such as 'job task analysis' and 'competency-based'. | Terms unique to the process will be defined in the standard. |
| Guy Zito Kathleen Goodman Ralph Rufrano Greg Campoli Pete Lebro Roger Champagne Khaqan Khan Al Adamsom David Kiguel Robert Pelligrini David Little Brian Hogue Jerry Mosier | | | No Comments | |

Consideration of Comments on First Draft of SAR for Personnel Training

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| James Stanton | | <p>The statement, Any person with access to a control room should be trained, from the blackout report, should be clarified. What kind of control room? Is this a control area? An RTO control room? A power plant control room?</p> <p>Also, there are essential pieces missing from the proposal, such as what are the goals of the training program? It is quite exhaustive in the elements of a training program but fails to explain what objectives are to be met. Beyond the broad goal of promoting the reliability of the Interconnections, what subject matter is envisioned to fall into the recommended elements that would be applicable to all the Reliability Functions to which it is intended to apply? A good example is simulator training. Simulator training on what?</p> <p>The current proposal is so overly broad as to be unworkable. More explanation of the goals of the training program and the applicability to the Reliability Functions must be presented. This is too important a subject to apply the broad brush of a one-size-fits-all Training Standard.</p> | <p>Please refer to our Responses to General Comments above.</p> <p>In regard to “any person with access to a control room”, the revised SAR does limit its applicability to those system operators performing real-time tasks that directly impact the reliability of the Bulk Electric System. Support tasks and personnel will be addressed after an additional study is completed.</p> |
| John Neagle | | <p>Associated Electric Cooperative Inc. reiterates its comments above that a training standard should address the desired outcomes and should not detail the methods to achieve those outcomes.</p> <p>Prescriptive requirements for facilities, tools, materials, funding, staffing levels, methods, etc. should not be included. These details are best determined by and should be left to the discretion of the individual company.</p> <p>Associated Electric Cooperative Inc. respectfully requests the Standards Drafting Team fully and carefully consider the industry's comments submitted in response to publication of the System Operator Certification Program Administrative Guidelines. Special attention should be given to the comments regarding the number of training hours (CEH) required.</p> | <p>It appears that the Drafting Team did not provide sufficient explanation with the initial SAR about the approach it was taking to writing the standard. The revised SAR includes considerably more explanation. Also, the revised SAR includes many changes in response to comments. We ask the respondent to review the revised SAR and comment, hoping that the revisions and additional explanation about our approach will satisfy some of the respondents concerns.</p> |
| Karl Bryan | | No comments | |
| Karl Tammar Dale McMaster Ed Riley Sam Jones Peter Henderson | | <p>Again, the one-size-fits-all approach does not appear to be justified. If an operator or authority does not need to be certified, their training requirements should be less. Continuing education with some focus on recommended topics that could be tailored locally would be valuable and would relieve</p> | <p>We agree. That is why the approach to the standard will be to require a systematic approach to training. The standard will be focused on following a valid process, but every organization will need to determine its own training needs based on the tasks its personnel perform.</p> |

Consideration of Comments on First Draft of SAR for Personnel Training

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| <p>Peter Brandien Bill Phillips Bruce Balmat Charles Yeung</p> | | <p>much of the administrative burden.</p> <p>It might be better if this standard applied (for now) only to those entities that must be certified.</p> <p>Training of everyone is important and necessary, but consider the administration if NERC required that each RRC check every generator operator and purchasing selling entity training records versus this standard. If the industry agrees that Generator Operators and others need to be certified then apply the standard. Again, training programs are probably better evaluated locally.</p> <p>A continuing education requirement with some in a set of approved topics may be more appropriate for non-certified entities.</p> | <p>This standard does not address NERC operator certification requirements.</p> |
| <p>Kathleen Davis Jeff Newsome Rick King</p> | | <p>No comments</p> | |
| <p>Peter Henderson</p> | | <p>Again, the "one-size-fits-all" approach does not appear to be justified. If an operator or authority does not need to be certified, their training requirements should be reduced. A continuing education with some focus on recommended topics (that could be tailored locally) would be more appropriate and would relieve much of the administrative burden for non-certified entities.</p> <p>It might be better if this standard applies (for now) only to those entities that must be certified.</p> | <p>We agree. That is why the approach to the standard will be to require a systematic approach to training. The standard will be focused on following a valid process, but every organization will need to determine its own training needs based on the tasks its personnel perform.</p> |
| <p>Theodore G. Pappas</p> | | <p>No Comments</p> | |
| <p>Thomas Bradish</p> | | <p>No Comments</p> | |
| <p>Alan Gale</p> | | <p>5a. "support staff" needs to be clarified. If the position does not need to be certified, why do they need to fall under this requirement. Are we saying that the training requirements of their respective professional certification (i.e. PE) is inadequate? The same can be said of "management".</p> <p>8a. Why does a companies training plan have to adhere to the CE program? There is no discussion here of how to maintain certification. In fact it is patently obvious that it was intentionally avoided. Is the goal of this to have quality training or further the CE programs viability? Why can't all the training requirements be in</p> | <p>The revised SAR does limit its applicability to those system operators performing real-time tasks that directly impact the reliability of the Bulk Electric System. Support tasks and personnel will be addressed after some additional studies are completed.</p> <p>The scope of training is much broader than the NERC continuing education. The Continuing Education (CE) Program was set up to provide a method for certified system operators to maintain their NERC certification by receiving training that applies to their job more than the current method for recertifying, which is to re-take the same exam they took 5 years ago. The NERC Board of Trustees wanted the CE Program to be an established</p> |

Consideration of Comments on First Draft of SAR for Personnel Training

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| | | <p>one place?</p> <p>8b. Approval and revocation processes for what? Being a CEH provider or certifying my training program? Compliance monitoring should be sufficient. Why is a separate process needed? The CEH process already contains a system for approval and revocation, it's duplication here will increase administrative work load unnecessarily.</p> | <p>and proven program before tying it to recertification. The Personnel Certification and Governance Committee (responsible for the integrity of the system operator certificate) is in the process of initiating recertification through continuing education. That is outside the proposed training standard, although the training standard must be sufficiently comprehensive to provide for it. Training must go beyond certification in providing a protocol that ensures that system operators receive the training they need for their specific job.</p> |
| Mark Heimbach | | <p>Some random thoughts: Although we do operate in several Reliability Councils and I admit there are clearly regional differences, the minimum standard should be global so I don't have to meet different minimum standards. The training should be web/computer based so it is available during back shifts. The training needs to be geared towards the responsibilities. For example, the minimum level for Generator Operators need not be at the same level as that of Reliability Coordinators. The costs should be spread across all market participants because the entire market benefits from reliability..</p> | <p>We agree. That is why the approach to the standard will be to require a systematic approach to training. The standard will be focused on following a valid process, but every organization will need to determine its own training needs based on the tasks its personnel perform.</p> |
| Howard Rulf | | <p>All training should not be required to be in the NERC CEH program.</p> | <p>It will not be in the training standard.</p> |
| Ken Goldsmith | | <p>Somewhere the standard should encourage/recommend that the Regions should form Training Groups to promote uniform training throughout the regions. This will help promote a better understanding of operations, by all the parties.</p> | <p>The Drafting team agrees with the business sense of this suggestion, but resource utilization is outside the scope of the training standard.</p> |
| Gerald Rheault | | <p>No comments</p> | |
| Richard Kafka Michael Maher William Mitchell David Thorne Vic Davis Val Hildebrand | | <p>No comments</p> | |
| William Smith | | <p>No Comments</p> | |
| Michael Calimano | | <p>No Comments</p> | |

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| Raj Rana | | | No Comments | |
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