

FTCP FY09 OPSPLAN: Competency Development
(1/23/09)

- Objective 1: Define and describe the key steps an individual should take following initial TQP qualification to achieve status as a DOE-recognized expert. (Dave Chaney)**
- Action 2: Draft Attributes, Responsibilities and Qualification methods for current DOE/NNSA Experts. (Draft dated 1/14/09)**

Attributes of a DOE/NNSA expert should consider definitions and applications of the term “expert” within DOE and the commercial nuclear industry, resulting in the capability to provide high quality technical advice and deliverables:

1) The DOE FTCP Functional Area Qualification Standard Template defines an expert level of knowledge as:

- **Expert level is defined as a comprehensive, intensive knowledge of the subject or process sufficient to provide advice in the absence of procedural guidance.**

2) The Institute for Nuclear Power Operations (INPO) ACAD 97-014 (Rev.1, December 1998), National Academy for Nuclear Training Guidelines for Instructor Training and Qualification, defines Subject Matter Expert (SME) as:

- **An individual qualified or previously qualified and experienced in performing a particular task. An SME may also be an individual who by education, training, and/or experience is recognized as an expert on a particular subject or system.**

3) The NNSA Draft Safety Basis Professional Program (SBPP) capitalizes on applicable elements of the Federal Technical Capability Program. DOE-STD-1183-2007, *Nuclear Safety Specialist (NSS) Functional Area Qualification Standard*, establishes the functional capabilities necessary to qualify as an NSS and includes competencies at both the familiarity and working level. This standard notes the need to consult with an expert, but does not identify functional qualifications for a safety basis expert, or a process by which an NSS could achieve expert levels of experience and knowledge. The SBPP provides course work and test-out options that can be used to demonstrate acquisition of an expert level of knowledge. Future revisions of the SBPP will consider the institution of a qualification program to demonstrate achievement of expert levels of proficiency in the nuclear safety functional area. NNSA Safety Basis Academy courses are categorized as Level I, Level 2 and Specialty courses. Details of the Draft NNSA SBPP are contained in Appendix 1.

4) The DOE TECHNICAL PROFESSIONAL CAREER DEVELOPMENT PROGRAM was a deliverable under DNFSB Rec. 2004-1 and provides an expert base career path within DOE (Expert Base excerpt contained in Appendix 2).

5) NNSA Safety Professional of the Year Selection Criteria evaluates nominees on unique or notable contributions that clearly distinguish job performance and achievements as an NNSA Federal Safety Professional from those of other competent employees. This tends to be performance-based, but also has aspects of expert capability. The selection criteria are contained in Appendix 2.

A. **“Attributes” (typical characteristics) of an expert in a particular technical area:**

- 1) **Recognized as technically credible in a discipline or industry through certification (e.g., Professional Engineer, Certified Safety Professional by the American Society of Safety Professional, Certified Industrial Hygenist by the American Board of Industrial Hygenists, Certified Health Professional by the American Board of Health Physicists, etc.);**
- 2) **Advanced technical knowledge as evidenced by an advanced technical degree(s), publications (in peer-reviewed professional journals or under the auspices of a reputable publisher) and/or instruction in technical disciplines in the particular area;**
- 3) **Recognition for Technical Leadership in particular technical disciplines by its community of practice;**
- 4) **Membership on professional committees, such as standards-setting organizations;**
- 5) **Long-standing experience and success in resolving technically complex problems across a variety of technical missions;**
- 6) **Innovative research/development accomplishments in particular technical disciplines.**
- 7) **Certain Organizational technical positions (e.g., Authority Having Jurisdiction, Technical Directors, etc.)**

B. **“Responsibilities” of an expert in a particular technical area:**

- 1) **Maintain certification, consensus standard or committee involvement and technical discipline expertise through continuing learning or publication;**
- 2) **Establish accessibility to the technical community to consult on technical issues, providing expert advice and judgement on complex technical problems and issues in the particular discipline;**
- 3) **Maintain involvement in peer reviews and expert panels applicable to the particular technical discipline;**
- 4) **Develop policy, technical standards and/or directives applicable to the particular discipline.**

C. **“Qualification” methods:**

- 1) **Oral Boards of technical peers, supervisors or approving officials, understanding that experts may have no technical peers;**
- 2) **Written exams combined with demonstrated successful application of the technical discipline;**
- 3) **Certification by a senior official (e.g., Central Technical Authorities (CTA), Chief of Defense Nuclear Safety (CDNS), Chief of Nuclear Safety (CNS), FTCP Chair, DOE/NNSA Undersecretary, etc.) or periodic recertification following completion of practical applications or a nomination process.**

D. Issues:

- 1) **Funding for training;**
- 2) **Limited supply of experts or peers;**
- 3) **Periodicity of recertification;**
- 4) **Nomination to receive certification should be through an organizational process based on mission need, not self-nominating.**

Appendix 1

NNSA Draft Safety Basis Professional Program (SBPP)

Excerpt

LEVEL 1 (L1-1) Courses (or test out) (no priority implied by numbering sequence)

- L1-1 Technical Safety Requirements Developer
- L1-2 Safety Basis Document Preparation – Advanced (DOE STD 3009)
- L1-3 MELCOR Accident Consequence Code System 2 (MACCS2)
- L1-4 Hazard Evaluation Techniques I or Hazard Evaluation Techniques II
- L1-5 Hazard Identification
- L1-6 Accident Analysis Techniques
- L1-7 Airborne Release Fractions and Respirable Fractions (ARF & RF)
- L1-8 Non-SBA Course: Unreviewed Safety Question (USQ) Process
- L1-9 Technical Writing Geared to SER Author (Note: Non-SBA Course)

LEVEL 2 Courses (or test out)

- L2-1 Chemical Facility Safety Basis
- L2-2 Areal Locations of Hazardous Atmospheres (ALOHA) Modeling Code (or EPIcode Modeling Code)
- L2-3 Consolidated Model of Fire Growth and Smoke Transport (CFAST) Modeling Code

Specialty Courses (SC) (optional but highly recommended for Level 2 (**))

- SC-1 Safety Basis Overview^R
- SC-2 Specific Hazards Analysis
- SC-3 Safety Basis Document Preparation – Basics^R
- SC-4 Analytical Modeling Techniques Overview^R
- SC-5 GENII Modeling Code
- SC-6 Hazard Categorization**
- SC-7 Environmental Restoration, D&D Safety Basis**
- SC-8 Nuclear Safety Management (10 CFR 830)**
- SC-9 Packaging and Transportation Safety Basis Documentation**
- SC-10 MECOR Modeling Code**
- SC-11 Accelerator Facility Safety Basis

^R Means specialty refresher course for those working on requalification

Successfully completing the Level 1 courses (or passing a challenge exam for these courses) provides an additional level of rigor and formality in obtaining working level competencies for the Nuclear Safety Specialist (NSS) Functional Area Qualification Standard. Level 2 and Specialty courses are designed to help develop an expert level of knowledge in selected areas of NSS duties and responsibilities, such as nuclear safety analysis calculations, confirmatory modeling, control selection, etc. that is most needed at the particular site. A sample continuous learning process that complies with the NA-1 SD 426.1-1A, *Technical Qualification Program*

Plan for Federal Personnel with Safety Responsibilities at Defense Nuclear Facilities, is provided. The process proposed is also similar to those proposed for nationally recognized professional certifications like CHP, CIH, PE, and others. The NNSA Safety Basis Academy courses should be included in the continuous learning process for SBPs to the maximum extent possible.

SAMPLE SBPP CONTINUOUS LEARNING PROCESS

NOTE: For purposes of illustration, numerical values have been inserted. These values are “typical” of PE and CHP requirements.

A total of 75 continuing education credits are required for re-certification/re-qualification. No single course, meeting or activity shall be awarded more than one-third of the total credits for re-certification. A continuing education activity is an activity that contributes to the continuing education and/or training of a Safety Basis Professional. Such activities may be formal or informal; however, all activities should contribute to the technical competence of the Safety Basis Professional’s practice of safety analysis. Such activities may include subjects used directly in safety analysis but not usually designated as safety analysis, for example courses in statistics, meteorology as applied to environmental dose-assessment, chemistry, safety system design, industrial hygiene, data base management, program management and others.

A senior, qualified Safety Basis Professional (or committee) should evaluate each activity on the basis of content, duration and applicability to the assignment of the applicant. After evaluating the appropriate factors the Committee (or Senior SBP) will assign to each activity a number of Continuing Education Credits (could also be called Professional Development Hours) in accordance with established criteria. There are 3 major categories of activity that are approved:

- Group A – Formal Training and Educational Activities
- Group B – Publications, Reports and Presentations
- Group C – Professional Society Participation

ASSIGNMENT OF CEC’S (again inserting nominal numbers for illustration)

Group A

College Course directly related to a Safety Basis Competency	16/course
College Course in a related engineering or science topic	8/course
Short Course in a related engineering or science topic	1/contact hour
Safety Basis Academy Course (based on length of each course)	Minimum of 12 (1-day Safety Basis Academy course) to maximum of 48/course for a 4-day course

Group B

Publication of SER for major DSA level document as Team Lead	8
Publication of SER or similar evaluation as Tm Mbr	4
Instructor in SBP basic or specialized course	16/week
Lecture presentation at professional meeting (e.g., SAWG)	1/contact hour

Group C

Scientific/Engineering Meetings at National Level	3/day up to max of 12
Symposia on SBP subjects	2/day up to max of 6
SBP related technical committee membership (ASME, ASTM, HPS, ANS, etc)	4/year

FURTHER DISCUSSION OF CREDITABLE ACTIVITIES

Group A: College courses are offerings by accredited institutions for which academic credit is offered. These courses must be professionally enhancing. Courses can be audited or taken for credit. Short courses, symposia and workshops are technical courses, symposia and workshops in safety analysis areas.

Group B: For publications, sole authors, joint authors and authors of chapters are eligible to receive credit. Credit awarded to joint authors and authors of chapters will be based on their contribution to the total work. For presentations, these efforts must be technical presentations at local, regional, or national scientific or engineering meetings on a safety basis related topic. Note that credit is given for either presentation or publication, not both for the same document.

Group C: Scientific Meetings must offer the Safety Basis Professional the opportunity to keep abreast of current developments and to maintain and upgrade skills. Participation in technical or standards committees such as Panels of Examiners, Accreditation Boards, etc. provide important opportunities to advance the Safety Basis profession as well as enhance the knowledge and skills of the Safety Basis Professional.

Appendix 2

DOE TECHNICAL PROFESSIONAL
CAREER DEVELOPMENT
PROGRAM DESCRIPTION (August 15, 2006)
Excerpt on Expert Base

Expert Base

The Expert Base phase of the TPCDP is directed toward a limited number of select employees who wish to continue to excel within their chosen profession. These employees are typically GS-15 or pay band IV, and, in select cases, they may become Senior Executive Service employees. The training and development program for these personnel is typically individually based and focused on achieving technical excellence within a specific discipline such as fire protection, criticality safety, structural engineering, or similar discipline. Employees in the Expert Base may continue to pursue advanced education to obtain a PhD in their technical discipline; in select cases, the Department will strive to support their choice through educational reimbursement or fellowship programs. Employees should also continue to pursue advanced training (not degree related) provided by professional organizations, educational institutions, other agencies, or commercial providers.

Employees in the Expert Base should also pursue other experiential opportunities in their technical discipline. At a minimum these experiential opportunities would involve short- and mid-term assignments within the Department in areas that allow for growth within their technical discipline. Such opportunities may include assignments on operational readiness review teams, accident investigation teams, assessment teams, or assisting other offices with a particular technical issue or project. Employees in the Expert Base should also pursue temporary assignments with other agencies or industry organizations to broaden their base of knowledge in their specific technical discipline.

In addition to continuing to pursue other education, training, and experience in their technical area, employees in the Expert Base should also pursue opportunities to participate on professional committees, such as standards-setting organizations, and should expect to earn professional certification before being promoted to the grade of GS-15 or Pay Band IV. The Department may support professional certification through training and reimbursement of certification costs on a case-by-case basis. Employees in the Expert Base should also periodically speak on topics and issues at outside conferences and publish articles in professional journals.

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