



Crisis Decision Making for Nuclear  
Leaders

# User Guide





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**Version 1.1**

**November 15, 2016**

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# Revision Log

This log applies to all course resources.

Date	Revisions
September 30, 2016	Version 1.0
November 15, 2016	Version 1.1: Incorporated framework of INPO 15-005 and made editorial revisions.

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# Overview

## Purpose

The nuclear industry's response to the Fukushima event exposed a need for training to address decision making under stress.

## Learning Design

*Crisis Decision Making for Nuclear Leaders (CDM4NL)* is a four-hour interactive classroom session recommended for four to 18 participants. One facilitator can deliver the classroom portion of the course with assistance during some classroom activities, and one facilitator per group of four to six participants during the two-part practical exercise.

## Learning Objectives

**Terminal objective:** Given your role as an emergency responder, understand and apply tools that support effective decision making under crisis conditions, as described in the generic advanced FLEX course and in this course.

**Enabling objectives:**

1. Define stress and describe its effects on the brain and body.
2. Describe how stress resilience and tolerance affect your ability to perform under stress.
3. Apply tools for recognizing, checking and controlling the effects of stress for yourself and others.
4. Discuss methods that support effective decision making during crisis conditions.
5. Contrast rational and intuitive decision-making methods and their applications.
6. Describe the influences of emotions on leading during a crisis.
7. In a simulated nuclear plant crisis event, apply methods for decision making under stress using the concepts and methods presented in this course.

# Major Concepts

## Effects of Stress

Every person has a stress response, but every person's experience is different. Participants demonstrate the stress response using a medical quality wrist monitor and stress-inducing activities. Using a checklist and discussions, participants have the opportunity to identify their personal stress responses.

## Stress Training

The course describes in detail several approaches to minimizing stress:

- Treating negative stress when it occurs, and knowing how to recognize it in others.
- Building stress resilience through mindfulness practice, personal support, a positive attitude, life-long learning, and better health.
- Building stress tolerance by increasing confidence in skills and experience, reducing daily stress, and examining novel approaches to stressors.

Participants develop an action plan for "stress training" in advance of a crisis event.

## Decision Making Under Stress

Traditional decision-making processes are challenged for their usefulness during crises. The recognition-primed decision making model is explained; this model emphasizes the importance of experience in recognizing patterns and courses of action in a crisis.

## Crisis Leadership

Crisis leadership tools build upon the participants' new knowledge of the effects of stress and the challenges of decision making.

Participants and facilitators have the opportunity to explicitly state and discuss the personal impact of a crisis and the ultimate responsibility to protect the health and safety of the public.

A practical exercise presents a scenario (earthquake, plane crash, or toxic gas leak) and requires teams to prioritize their time and resources as the situation becomes more volatile and complicated by additional stressors. In the after-action review of the exercise, participants review their application of the tools presented in the course, and they anticipate using these tools in an actual crisis.

## Practical Exercise

The practical exercise in this course is designed to:

- Set up discussions about how participants can prepare to manage crises effectively.
- Demonstrate the types of decisions that can come up within the context of a nuclear plant crisis.
- Induce stress, and cause participants to make decisions under stress.

The exercise is used twice in the course:

- Part 1 introduces participants to the scenario and the exercise instructions, while inducing stress and preparing participants for their first discussion of stress.
- Part 2 enables participants to practice using the tools they will have learned in the course, and prepares them to discuss their strengths and areas for improvement.

One of the following scenarios is presented:

- Earthquake
- Plane Crash
- Toxic Gas

The entire class, regardless of size, works on the same scenario in groups of four to six.

A video for the scenario introduces the situation, sets the pace, provides new information, and generates time pressure. At certain intervals, teams account for their people and track the Core Temperature, Water Level, and Spent Fuel Pool Temperature according to the conditions on their board. In this manner, they can see the consequences of their decisions and actions.

The scenario video also includes an interactive multiple-choice question. Given a new situation, each team selects an answer, and then updates conditions on their board according to their selection.

## Facilitator Qualifications

Facilitators of this course will preferably have the following qualifications:

- Knowledge and experience of plant operations and emergency response functions, but not necessarily an SRO certification
- First-hand experience during a crisis or emergency event: Such experience may be gained from the military, work in medical or fire emergency response, control room experiences, or other rapid response to an emergency at a nuclear station (in maintenance, radiation protection, etc.)
- Experience as an facilitator of leadership or other “soft skills” adult training

## Facilitator Self-Training

The objectives for facilitator self-training are as follows. The facilitator will be able to:

1. Personally satisfy the terminal and enabling learning objectives of this course, such that they can:
  - a. Understand the topical content sufficiently to answer questions about the concepts, three questions deep.
  - b. Determine whether participants are meeting the learning objectives.
  - c. Be a role model in developing stress resilience, stress tolerance, and crisis leadership skills as appropriate to their role.
2. Conduct the activities in this course with ease.
3. Demonstrate and instruct participants on the proper use of the biofeedback monitors (if used).

## Preparing Topical Content

Facilitators should plan to spend time learning and understanding the topical content well in advance of their first session. The following resources will help the facilitator prepare:

Required reading: *Crisis Decision Making for Nuclear Leaders Handbook*

Optional resources, which may also be assigned to participants as pre-work:

- *The Stress Effect* by Henry L. Thompson
- The ARSENAL™ assessment for recognizing and managing stress

### **ARSENAL™ Assessment**

ARSENAL™ is an online assessment that provides feedback on stress tolerance and resilience. It measures effectiveness in the practice areas of Awareness, Rest, Support, Exercise, Nutrition, Attitude, and Learning (ARSENAL™). The assessment report includes a personal development plan and practical steps for immediate improvement in problem areas.

ARSENAL™ is a fitting pre-work exercise for this course. It is not required. Facilitators can learn more about ARSENAL from the High Performing Systems, Inc. website at:

[http://www.hpsys.com/Assessments\\_ARSENAL.htm](http://www.hpsys.com/Assessments_ARSENAL.htm).

If used as pre-work, ARSENAL™ may be discussed as described in the “Stress Treatment” section of the course. Time for additional discussion of ARSENAL™ results is not included in the planned agenda.

## Preparing to Work with the Wrist Monitor

The provided biofeedback wrist monitor (Empatica E4 Wrist Monitor or comparable device) is a medical-quality biometric sensing device. The device creates a compelling graphic timeline of a person’s stress response using several different physiological metrics.

Use of the wrist monitor is highly recommended to demonstrate the physical responses to stress, even in individuals who do not believe they are subject to such a response.

Instructions in the *Facilitator Guide* explain how to collect biometric readings and display the data live using chart views provided by

Empatica. As an alternative to presenting live data, the facilitator may pre-record biometric data and display static pictures of the charts.

Well in advance of facilitating the course, the facilitator should become familiar with the operation of the wrist monitor, and devise the best method for displaying the data in the classroom. Complete instructions are in:

- The Empatica booklets that accompany the wrist monitor
- Facilitator Guide Appendix A. Wrist Monitor Display Instructions
- Facilitator Guide Appendix B. Wrist Monitor Use During the Course

## Preparing Classroom Activities

The course includes stress-inducing activities based on those used by scientists to study the effects of stress. They are the Trier Social Stress Test (TSST), the Stroop Color-Word Interference Task (CWT), and the Montreal Imaging Stress Task (MIST).

To demonstrate the effects of stress, it is not necessary to conduct all the stress activities provided. To conserve time, the facilitator should select the ones that work best for their participants, and customize them in any way desired.

## Preparing the Practical Exercise

At the beginning of the practical exercise, the facilitator will explain the rules and procedures. Therefore, the facilitator should prepare by running the practical exercise ahead of time using the scenario selected for use in the classroom. The facilitator's goal should be to become sufficiently familiar with the action and the flow of the exercise to explain all aspects of the activity and answer any questions that might arise.

For detailed instructions to prepare for course delivery, see "Practical Exercise Preparation" in the *Facilitator Guide*.

## Recommendations to Facilitators

Given the complexity of the subject matter, the following recommendations are provided to facilitators:

- **Give yourself ample study time.** The concepts in this course are advanced and different from many industry courses.
- **Read the *Handbook* thoroughly.** Be ready to explain the concepts and examples in your own words, and answer questions about the concepts, two to three questions deep.
- **Prepare your stories.** Look for the “Story” icon in the course guide. These are opportunities for you to tell your own story, use a video or guest speaker, or otherwise customize the course for your participants.
- **Customize the PowerPoint.** Adjust slide animations and add detail to speaker notes as you see fit.
- **Move through simple slides quickly.** During a presentation, it can be customary to spend the same amount of time on each slide. However, in the time allotted, some points only need to be mentioned briefly.
- **Practice thoroughly.** Become ready to move through this material within the allotted time. In particular, become comfortable using the wrist monitor and leading the classroom activities and practical exercise.
- **Make it your own.** Do not use the text provided here as a verbatim script. Use what works for you to achieve the learning objectives and to suit your own presentation style.

## Facilitator Self-Training Checklist

- Read the *Handbook* thoroughly, to prepare to facilitate discussions and answer questions on the major concepts of the course.
- Read the *Facilitator Guide* to learn how to prepare for each session, and how to deliver the lectures and activities in the course.
- Plan the Opening Remarks and First-Person Account sections of the course. These may be the First-Person Account videos provided, other media, or relevant remarks from an executive, colleague, or yourself.
- Develop stories and examples to use throughout the course (look for the “Story” icon in the course guide).
- For the practical exercise, learn and rehearse the instructional sections in Part 1.
- Rehearse conducting the entire practical exercise (Part 1 and Part 2) with peers as participants, using the scenario you will use in class. Become familiar with the decisions and consequences the participants will face.
- Become familiar with the operation of the wrist monitor, and observe your own responses to stress.
- Devise the best method for displaying wrist monitor data in the classroom, as described in Appendix A of the *Facilitator Guide*.
- Practice facilitating the stress-inducing activities and displaying wrist monitor data.
- Rehearse all facilitator-led portions of the course, customizing the PowerPoint slides as desired.
- Create an evaluation form that addresses the learning objectives of this course, and any additional objectives or concerns at your station. A sample is included in Appendix D of the *Facilitator Guide*.

# Course Resources

## Digital Assets

The following resources are available via the Nuclear Community. See “Obtaining the Course Resources” later in this guide.

Name	Description
User Guide (this document)	An overview of the course, instructions for obtaining the resources, and general requirements for delivering it.
Facilitator Guide	Step-by-step instructions for preparation and delivery of the course.
Handbook	<p>A comprehensive document describing the key points of the course and supporting learners’ further study. The <i>Handbook</i> is designed to be used:</p> <ul style="list-style-type: none"> <li>• By facilitators to learn the concepts and information to be presented in the course.</li> <li>• By participants as a review and guide for further study.</li> <li>• By facilitators to copy the handouts used in the course.</li> </ul>
Course Slides	Animated PowerPoint slides for presenting during the course, including speaker notes.
First-Person Accounts (folder)	<p>Video interviews for use in the “First-Person Account” sections of the course. These are interchangeable with other videos or speakers that reinforce the concepts of the course with real-world stories.</p> <p>These videos are also available for streaming in a web browser. Hyperlinks are available in the course slides and the <i>Facilitator Guide</i>.</p>
Practical Exercise (folder)	<p>Media, supplies, and instructions including:</p> <ul style="list-style-type: none"> <li>• Videos (per scenario)</li> <li>• Facilitator Reference Cards (per scenario)</li> <li>• Setup Maps (per scenario)</li> <li>• Role Sheets (participant instructions)</li> <li>• Practical Exercise Kit Ordering Instructions</li> <li>• Practical Exercise Artwork ZIP file, containing print-ready files for all supplies in the Practical Exercise Kit</li> </ul>

## Tangible Assets

INPO provided these supplies to each corporate training manager or emergency preparedness manager as part of the initial course deployment in October 2016. Additional Empatica Wrist Monitors (or comparable devices) are commercially available. Information on purchasing or producing additional Practical Exercise Kits is included with the digital assets.

Name	Description
Empatica Wrist Monitor or comparable device	A wearable biometric feedback device for use in the course activities.
Practical Exercise Kits	<p>Manufactured supplies for the practical exercise, in two packages:</p> <ul style="list-style-type: none"> <li>• Three Pillars Nuclear Power Plant: A Practical Exercise for <i>Crisis Decision Making for Nuclear Leaders</i></li> <li>• Accompanying tube containing the exercise board and extensions printed on vinyl</li> </ul> <p>One kit is required for each group of four to six participants. Each kit contains supplies for all three scenarios.</p>

## Obtaining the Course Resources

Accessing the digital assets is a two-step process: (1) join the INPO Nuclear Community, (2) join the “Crisis Decision Making for Nuclear Leaders Training” group.

1. Join the Nuclear Community at <https://community.nantel.org> by clicking the “Join here” link below the “Sign in” button, and completing and then submitting the registration form.
2. You will receive an email once you are admitted as a member into the Nuclear Community.
3. Once admitted into the Nuclear Community, join the “Crisis Decision Making for Nuclear Leaders Training” group as follows:
  - a. Access the Nuclear Community at <https://community.nantel.org> by entering your email address and password, agreeing to the terms of service and then clicking the “Sign in” button.
  - b. Click the “Training” group link on the top menu bar.
  - c. Click on the “Crisis Decision Making for Nuclear Leaders Training Resources” subgroup icon.
  - d. Click the “CDM4NL Files” link in the menu bar.
  - e. Search for the desired files in the gallery.
  - f. Click on the desired file link, then click on, and open the file that appears to the right. Save it to your computer for use.

## Feedback

Submit feedback to [NANTELHelpDesk@inpo.org](mailto:NANTELHelpDesk@inpo.org) with the subject line *Crisis Decision Making for Nuclear Leaders*.

For course evaluations, please upload evaluation sheets, summaries, and reports that will help future developers improve this course. In addition to participant evaluations and comments, please include feedback from the facilitator's point of view.

For error reports and suggested enhancements, please include:

- Numbers and titles of slides or pages, and applicable file or publication name
- Comments, concerns, or ideas for enhancement
- As applicable, a screenshot or other sample of recommended changes
- Any necessary files or attachments; for assistance transferring large files, contact the Help Desk at 770-644-8900.

Please consolidate feedback issues and documents into one submission for one or more sessions of the course.

Feedback will be prioritized and addressed as follows:

1. Technical issues will be addressed weekly, or immediately as needed.
2. Formatting issues will be tracked and rolled up into the next revision, and addressed during weekly revisions as resources allow.
3. Enhancements will be archived and reviewed during the next major revision.

All revised resources will be posted to the community following review by the Crisis Decision Making for Nuclear Leaders working group and INPO management. A Revision Log appears in the *User Guide* (this document).