

# INPO 10-005 Revision 1

Principles for Maintaining an Effective  
Technical Conscience

January 2019



# Background and Purpose

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- 5 Technical Conscience Principles were initially developed in 2009 by a group of experienced industry leaders
- These 5 principles were captured as INPO 10-005, Principles for Maintaining Effective Technical Conscience
- This document was perceived to be only applicable to engineers
- Technical Conscience Principles need to be used by everyone
- Revision 1 updates the language to include all leaders and nuclear professionals
- This presentation is a summary of the key concepts of Technical Conscience Principles

# What is Technical Conscience?

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- *The personal obligation that nuclear professionals internalize and exercise to ensure plant activities are conducted in a manner that is consistent with plant design and licensing basis, that ensures high reliability; and that preserves operating, design, and safety margins*

Definitions from other Industries:

- Our duty to keep each other informed and grounded in reality
- Keeping each other from hoping things will work out by presenting all the evidence and making sure that all doubts are raised

# Terms & Definitions

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- Nuclear Professional – all personnel who perform work at or support the safe operation of the nuclear station
  - This includes individual contributors, management and supplemental personnel who perform work at the station or provide technical products and services from corporate/vendor locations.
- Engineer and Technical Staff – all personnel, regardless of their organizational assignment, who perform engineering and technical type functions at the station or who provide technical products and services from corporate or vendor locations.
  - This includes performing technical evaluations, monitoring plant conditions, managing plant chemistry, analyzing test results, running diagnostics, performing temporary configuration changes, and technically interfacing with beyond design basis emergency response strategies.

## Terms & Definitions

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- Engineering Leader – personnel in the organization who have engineering expertise and exercise leadership or managerial activities, regardless of their department affiliation
- Leader – an individual who inspires, coaches and influences people to accomplish organizational goals while adhering to core values
- Senior Leader – senior leaders, plant managers and their direct reports (SLT) who act in a leadership role to inspire, coach, and influence people to accomplish organizational goals and pursue excellence.
- Corporate Executives – officers, including the site vice president, of the utility, corporation or operating company holding the operating or construction license of nuclear power plants.

# Purpose of Technical Conscience Principles

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Technical Conscience Principles were originally developed to address:

- Several AFIs in Performance Objective EN.1 “Engineering provides the technical information and support necessary for safe, reliable plant operation”
- Inconsistent leadership standards, expectations, and performance which resulted in plant events, reduced margins, reduced equipment reliability, and poor quality products and decisions
- Oversight and technical challenges were not fully effective in identifying and correcting shortfalls
- Initial decisions were sometimes based on weak technical input, and follow-up reviews were narrow in scope and do not fully consider additional information

## 5 Technical Conscience Principles

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1. Senior Leaders and corporate executives respect and reinforce the importance of technical considerations with a consequence-biased approach in decision-making
2. Leaders accept, support, and exercise their technical authority
3. Engineers and technical staff identify, communicate and advocate timely resolution of technical concerns
4. Engineers and technical staff adhere to sound principles and judgement to produce high-quality products and decisions
5. Nuclear professionals identify, question and advocate to resolve issues that may compromise nuclear safety or plant reliability

# Principle 1: Senior Leaders and Corporate Executives

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- *Senior Leaders and corporate executives respect and reinforce the importance of technical considerations with a consequence-biased approach in decision-making*
- This is demonstrated by understanding, respecting, promoting, and reinforcing the importance of technical considerations in decisions.
- Senior leaders:
  - Understand the need to apply technical conservatism and consider potential worst-case outcomes
  - Ensure appropriate balance between technical conservatism, margins, and business needs
  - Promote the culture for all nuclear professionals to identify and advocate for resolution to important issues and perform work in a high-quality manner

## Principle 2: Technical Authority

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- *Leaders accept, support, and exercise their technical authority*
- Engineering leaders recognize their unique role as the technical authority and exercise a deep sense of personal obligation to uphold their design and licensing basis technical authority
- All leaders recognize and accept their ownership and authority to:
  - Address plant technical issues
  - Proactively communicate functional area experience and knowledge to resolve issues
  - Ensure high-quality technical products and decisions are developed

## Principle 3: Timely Identification and Resolution

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- *Engineers and technical staff identify, communicate and advocate timely resolution of technical concerns*
- Engineers and Technical Staff apply their expert knowledge and skills to:
  - Identify trends and emerging technical issues
  - Communicate concerns
  - Advise management staff of potential consequences
- Engineers advocate the timely resolution of conditions
- A consequence-bias is maintained and worst-case outcomes are considered when addressing technical concerns

## Principle 4: Quality

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- *Engineers and technical staff adhere to sound principles and judgement to produce high-quality products and decisions*
- Engineers and technical staff ensure their products are of high quality from start to finish before signing them off as complete
- They develop technical recommendations and decisions by using:
  - Facts
  - Codes
  - Standards
  - Operating Experience
  - Review and Verification Processes

## Principle 5: Challenging Plant Conditions

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- *Nuclear professionals identify, question and advocate to resolve issues that may compromise nuclear safety or plant reliability*
- Nuclear Professionals challenge:
  - Plant Conditions
  - Technical bases of decisions
  - Accuracy of technical information and specifications
  - Plant performance
  - Requirements of plant design, licensing basis, or beyond-design-basis emergency response strategies
- All advocacy positions are formulated based on the best available facts, fundamentals, operating and functional area experience, and analytical techniques

# Review

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- Technical Conscience Principles are applicable to all Nuclear Professionals
- Engineering still has the same responsibility to act
- DNP and Project Legacy require improved ownership and teamwork to act as a collective technical conscience for the station