

Pursuit of Excellence in Performance Improvement

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Key Points of the Presentation

- Probabilistic risk assessments (PRAs) are an effective and powerful tool that facilitates the performance and safe operation of nuclear power plants (NPPs) through risk-informed decision-making (RIDM).
- In the U.S. industry, where the tool is properly functioning, the pursuit of excellence is a well-established part of NPP administration.
- The Japan Nuclear Safety Institute (JANSI) was launched in the wake of the Fukushima Daiichi (1F) accident to establish excellence-pursuing endeavors in Japan's industry.
- The foundation for risk information utilization would be reinforced by rendering the excellence-pursuing philosophy a solid part of Japan's domestic industry.



1. An Overview of JANSI



Monument Symbolizing JANSI



About JANSI's Monument

The **self-regulation sought after by the nuclear industry** is a **community-based** one led by operators and which aims to enhance nuclear safety in solidarity with JANSI. This concept is reminiscent of the **helm of a boat**.

- The grips of the wheel represent operators, with JANSI at the center of the helm. Both parts solidly connect, symbolizing “a self-regulating community that closely communicates with, trusts, and respects each other.” At JANSI, we value this community and hope to steadily nurture it.
- The helm of a boat also symbolizes the notion that “we are in the same boat,” a metaphor indicating that the nuclear industry is heavily influenced by each other’s performance.
- The boat we are aboard is by no means on an uncharted voyage. Sharing our unwavering course of action of pursuing excellence in nuclear safety, we will devote ourselves to steering the helm of this ship.
- We are confident that we can usher in a bright future for the nuclear industry as we demonstrate a strong commitment and professionalism of a self-regulating community that undauntedly confronts all kinds of challenges, tirelessly seeks the highest standard of excellence, and demonstrates a strong commitment and professionalism in the process of achieving a self-regulating community.

A helm of a boat delivers a message of this belief and determination of ours.

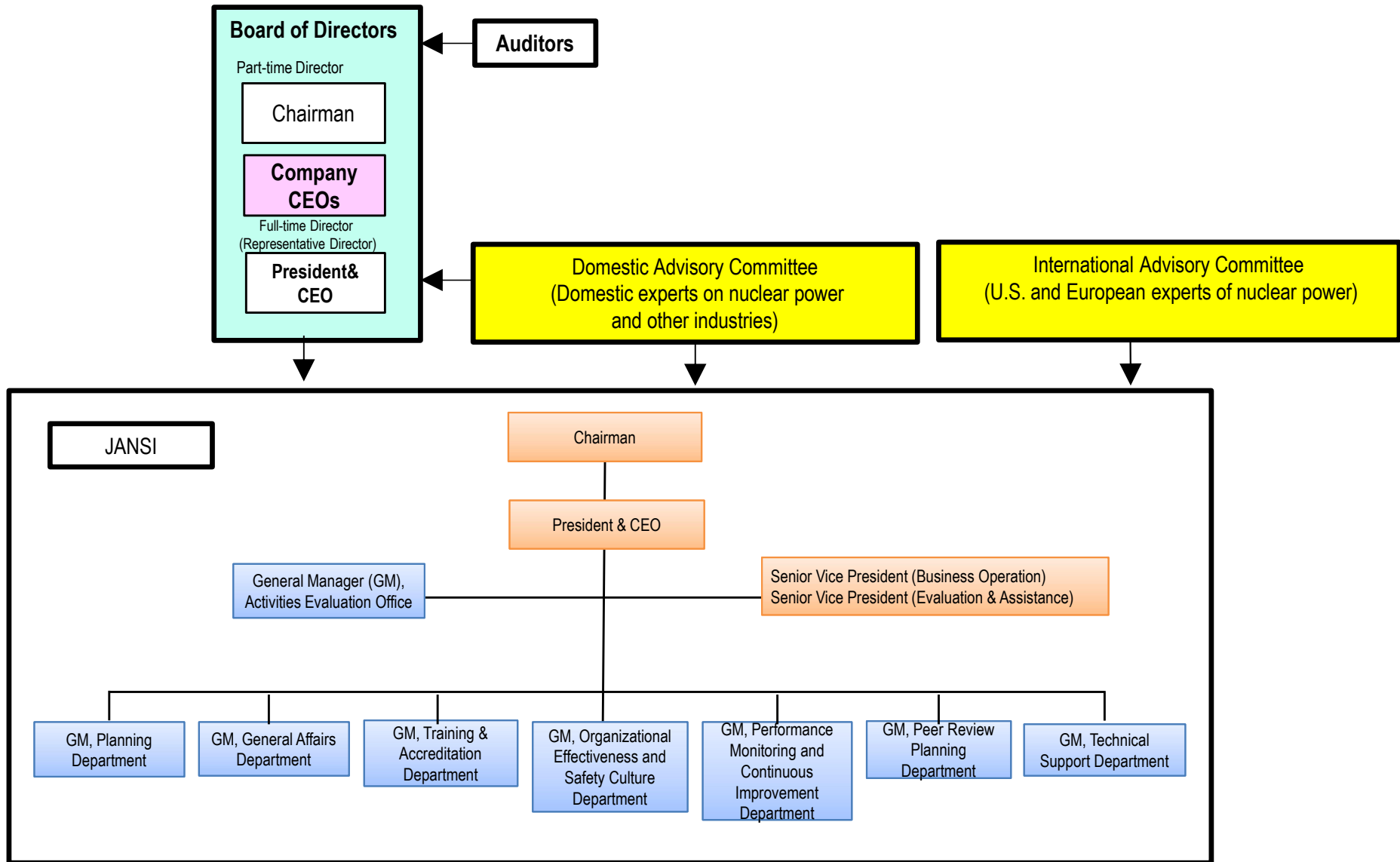




- Name of organization: Japan Nuclear Safety Institute (JANSI)
- Established: November 15, 2012
- Number of members: 128 (As of late March 2024)
- Number of staff: 187 (As of late March 2024)
- Chairman: William E. Webster Jr.
- President & CEO: Isao Kato



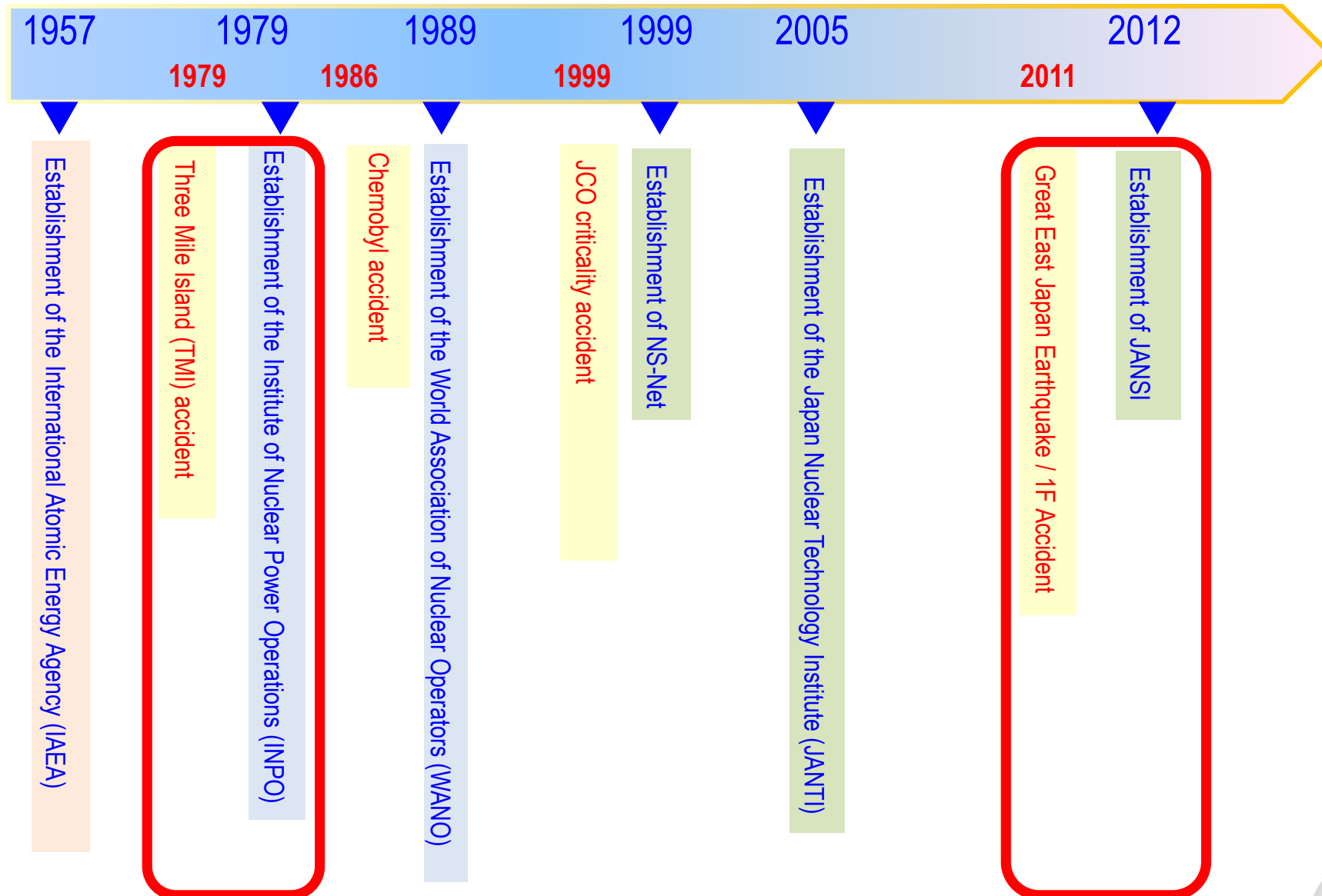
JANSI's Administrative Structure/Organization



2. History of Self-Regulation



Background: History of Hard-Learned Lessons



We Are in the Same Boat

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- ◆ Name: Institute of Nuclear Power Operations
- ◆ Overview: INPO is a self-regulatory organization of operators established in December 1979 by U.S. nuclear power operators to promote a high level of safety and reliability in commercial nuclear power generation, based on lessons learned from the March 1979 TMI accident.
- ◆ Background: The Kemeny Commission, which investigated the TMI accident, recommended that for promoting safety in nuclear power use, U.S. nuclear power operators “develop/implement a plan to establish independent management, quality assurance, and operation guidelines for operators,” “systematically collect, analyze, and review operating experience data of domestic and foreign power reactors, and establish an information network that informs operators the results of the review without delay.” The operators accordingly established INPO, a non-profit corporation.



INPO's Symbol



The word “Excellence” on the marble at the entrance hall of INPO—which JANSI modeled itself after—is unfinished.

This symbolizes the never-ending nature of the quest for improvement.



Excellence is about world-class activities and practices aimed at maintaining and enhancing nuclear safety in NPPs worldwide

⇒ The pursuit of excellence is a never-ending endeavor



- When established, industry granted significant authority to INPO, putting pressure on individual operators and the entire industry to reform.
- Industry supported INPO's development of the Performance Objectives and Criteria (PO&C), committed to complying with it, and both shaped and accepted a peer-review-based (PR) self-regulation model.
- The following six traits are helping in INPO's self-regulation model effectively realize the highest standard of safety and reliability in U.S. NPPs:
 - Participation of CEO: CEO's direct involvement in administration
 - Nuclear safety: Promote the highest level of safety and reliability (excellence) in plant operation
 - Wide industry support: Support by industry
 - Independence: Maintain independence, regardless of being part of the nuclear industry
 - Responsibility: Implement responsible operator evaluations
 - Confidentiality: Keep internal information private and use it constructively

(Excerpted from 2019 INPO-CEO congressional testimony record)



3. JANSI's Establishment and Self-Regulation



Regrets

Nuclear operators were conceited, thinking that domestic NPPs were sufficiently safe, and also considered that simply following regulatory requirements was enough. They thereby did not attempt to learn from efforts made abroad. They were also not enthusiastic about utilizing new knowledge.

Lessons learned

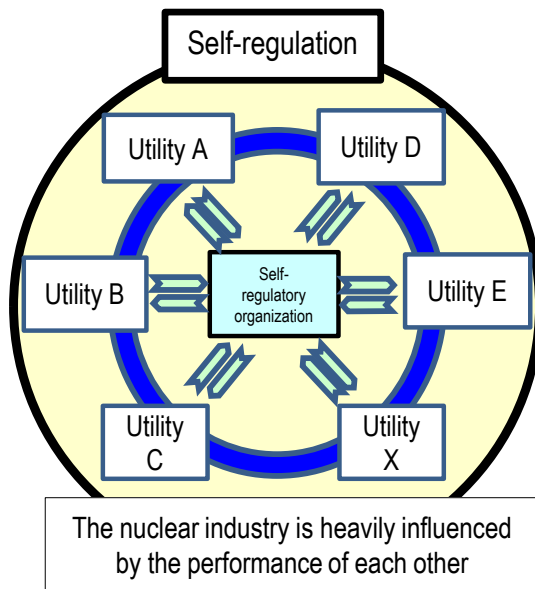
Recognized the necessity for nuclear operators to voluntarily keep pursuing the world's highest level of safety (self-regulation) by constantly learning and incorporating the latest knowledge and good practices of other utilities in Japan and overseas, without being bound by regulatory frameworks, to prevent a similar accident.



JANSI's Establishment and Self-Regulation

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To achieve self-regulation under the industry's consensus to “prevent the 1F accident from happening again,” JANSI (a self-regulatory organization) was established (Nov. 2012) by setting the U.S. nuclear industry's INPO as a role model, and as a system to pursue further excellence in a continuous and voluntary manner, with a private third-party organization serving a key part in leading nuclear operators from an independent perspective.



Self-regulation:

Self-regulation is about operators going beyond meeting legal regulatory requirements, practicing self- and mutual discipline, and endeavoring to voluntarily/continuously enhance safety, thereby pursuing excellence. (See “The Five Principles for JANSI's Operation” on the next page)

Self-regulatory organization:

A self-regulatory organization leads operators while maintaining its independence for an effective and efficient progress in operators' self-regulation.



The Five Principles for JANSI's Operation

-Aiming to Achieve Self-Regulation for the Nuclear Industry

1. CEO engagement

- Operator CEOs are actively engaged in the administration of JANSI, which includes providing governance and oversight.

2. Nuclear safety focus

- The primary focus is on nuclear safety. There is a clear mission, focused on achieving standards of excellence in NPP administration.

3. Support from industry

- The industry fully participates in JANSI activities and provides support in talent, and other aspects of resource.

4. Accountability

- Operators are accountable for the safety of their NPPs and to JANSI for the collective safety of the industry.

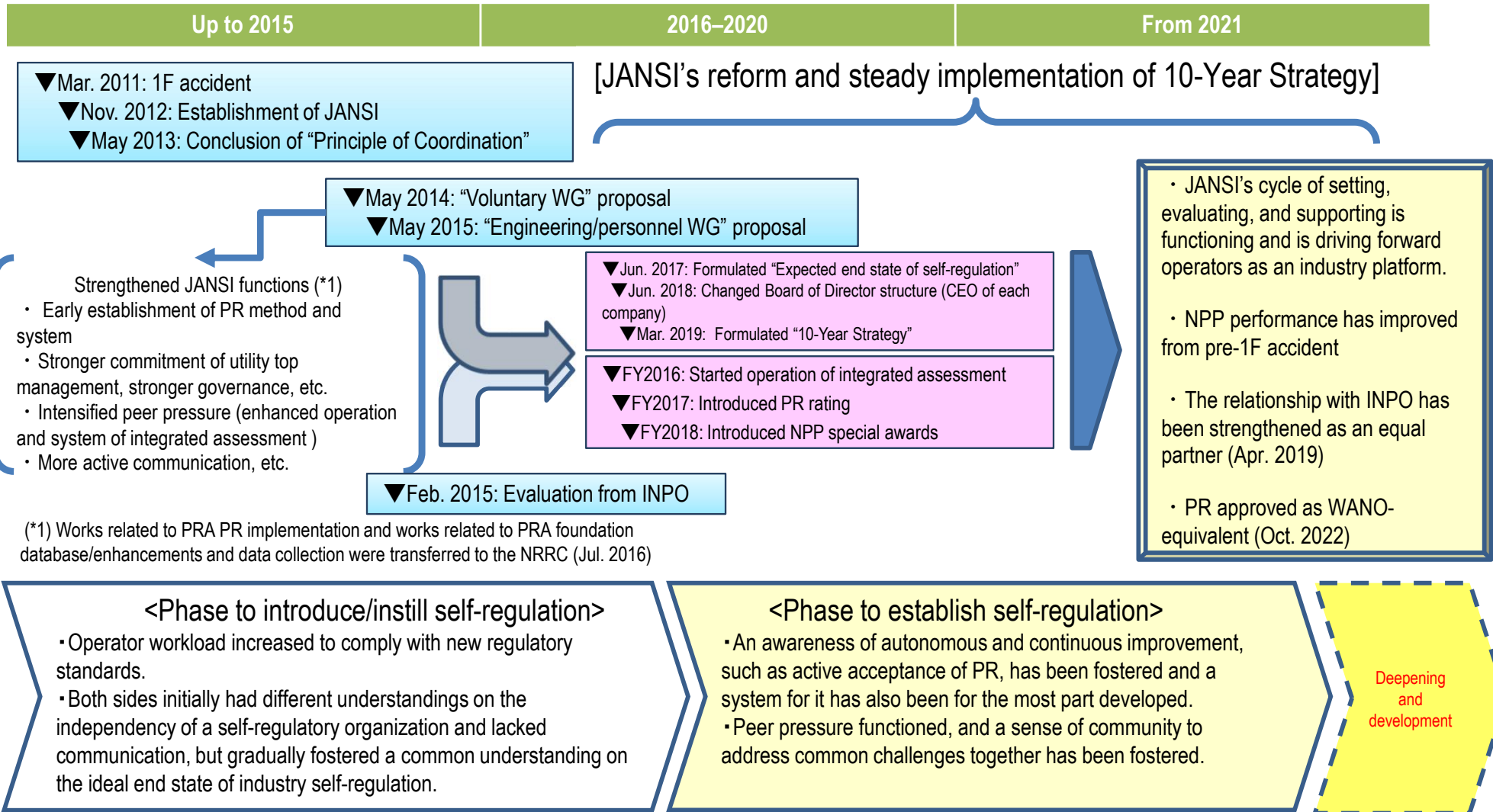
5. Independence

- JANSI depends on the entire industry but is independent from individual operators or operator groups.

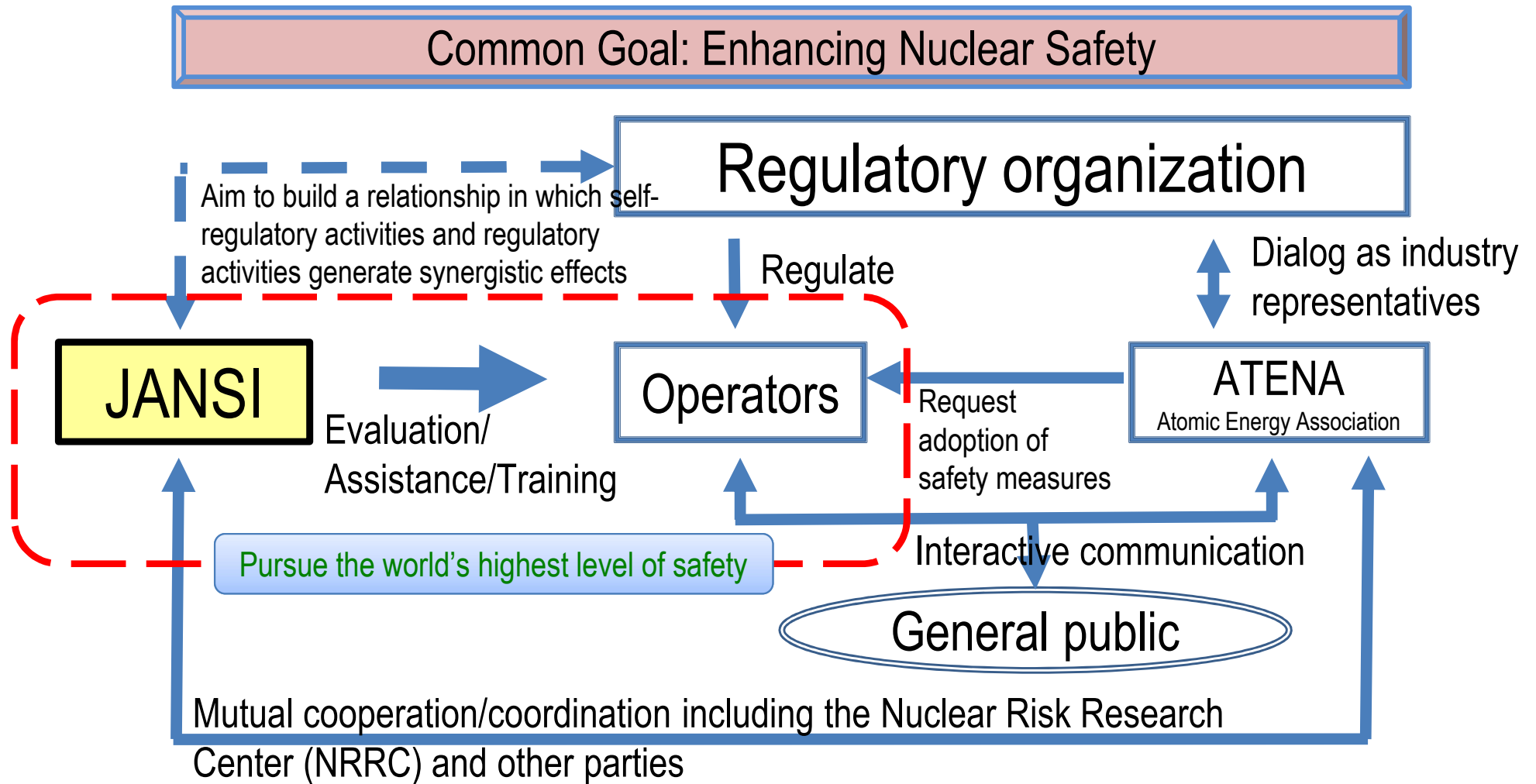
(Reference) Confidentiality of information

- JANSI has concluded a memorandum of understanding with operators and other parties, which stipulates such factors as the mutual provision of information, the handling of review information, and the disclosure of information to third parties, and in turn strictly observes the memorandum.





JANSI's Role in the Nuclear Industry



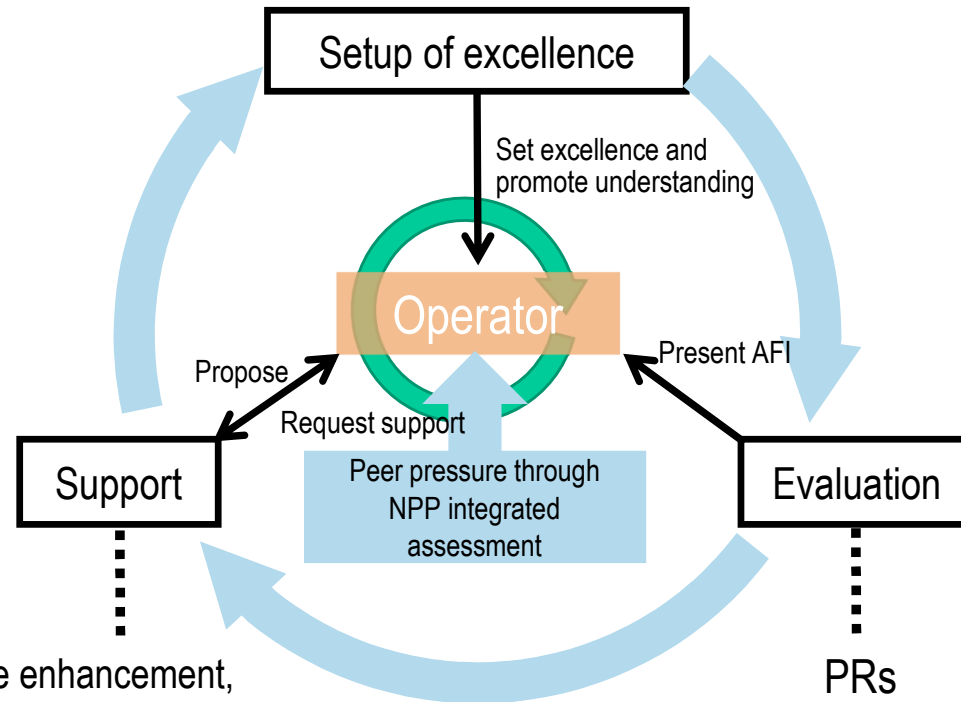
4. Activities for Pursuing Excellence



An Untiring Excellence Pursuit Cycle

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Clarification of excellence (guidelines, etc.)



Support of NPP performance enhancement, utilization of OE information, safety culture assessment, provision of leadership training, responses to individual support requests, support for common challenges, etc.



Overview: Peer Review

- A total of 33 PRs have been conducted since the establishment of JANSI (2012). (Basically once per NPP/four years)
- Dec. 2022: Approved as WANO PR-equivalent (WANO Board Meeting)
- Concluded MOU on the exercising of equivalency with WANO-Tokyo Centre (TC) (exercised equivalency in FY2023 3Q Shika PR*)
- For inputs to each PR, various sets of NPP information following the previous PR (e.g., trouble information, CAP information, safety culture assessment) are surveyed in advance and incorporated into the review plan.
- CAP information contains nuclear regulatory inspection results.

*** WANO-PR's exercising of equivalency**
 This refers to JANSI's implementation of PRs on behalf of WANO for WANO PRs, out of the PRs that JANSI and WANO each conduct every four years. JANSI conducts the PR using its own, equivalency-approved process.

<The Role of JANSI Peer Reviews>

- Evaluate all activities that affect safety of the operators
- Communicate to the JNO leaders about the performance status

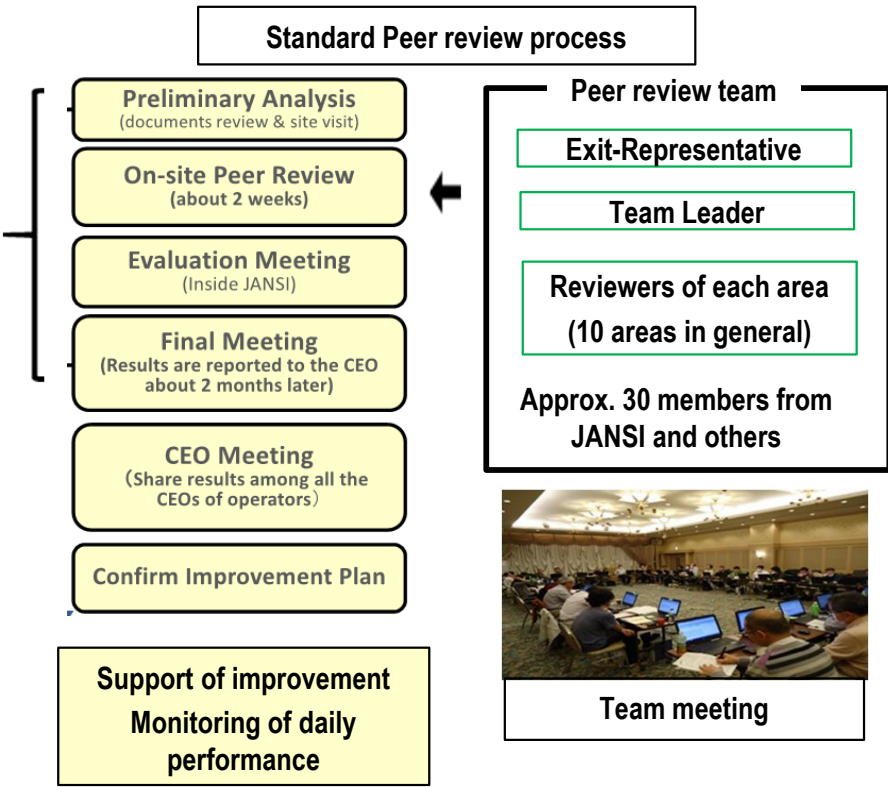
<Requirements for Effective Peer Reviews>

- Relationship of trust with the station is a prerequisite (interview content, reports, and other information will not be disclosed)
- Conduct objective and critical review that will lead to improvements

- Direct JNO to self-improvement through peer pressure
- Improvement by continuous involvement through evaluation and support

Ten PR areas (Fundamental)
 Organization/management system, operating experience, operation, emergency preparedness, maintenance, training, chemistry, radiological protection, engineering support, fire protection

Approx. 8 month

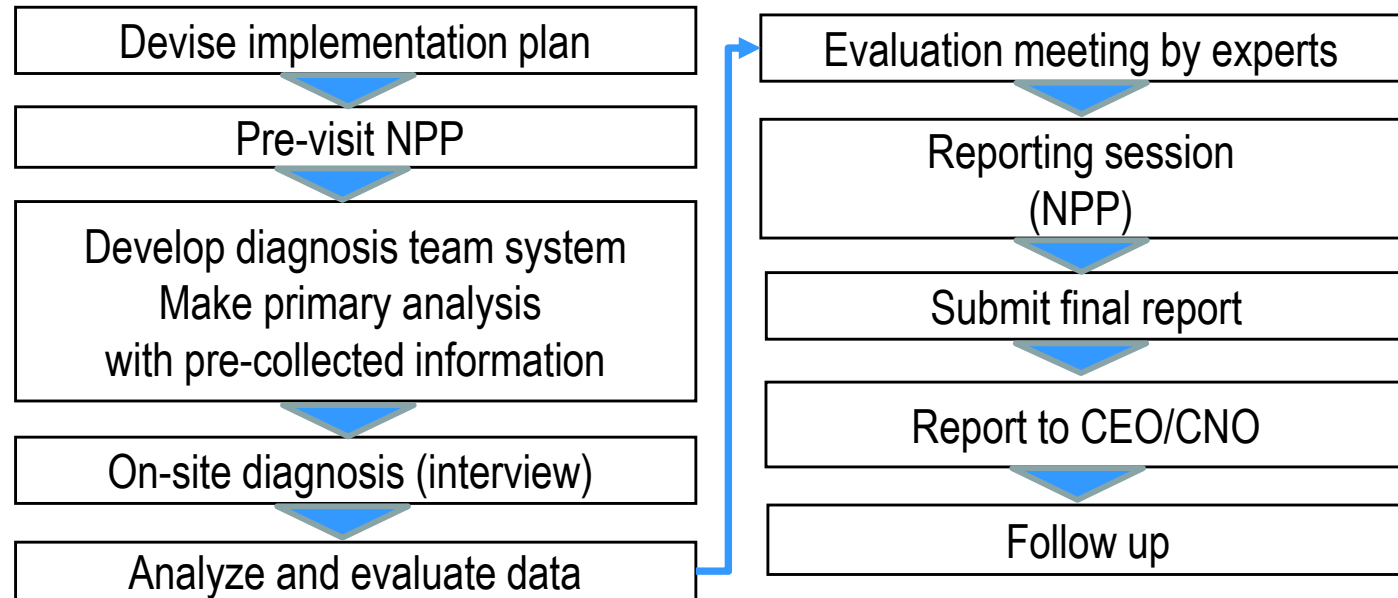


Overview: Safety Culture Diagnosis

➤ On-site diagnosis

- Sixty-three on-site diagnoses have been made in total since JANSI's launch (2012) (roughly once every four years)
- Covered sites: NPPs, fuel fabrication manufacturers, plant manufacturers
- The diagnoses present a viewpoint on how organizational culture is involved in maintaining and enhancing performance, including safety, and provide an opportunity to enhance the organization in question's learning ability.

Standard process (For NPPs)



Team performance improvement training (TPT)* support

Excellence

In light of the 1F accident, the operation team was required to respond in a controlled manner with clear priorities in the event of a prolonged complex trouble.
(Shift supervisor: oversight; assistant shift supervisor: command)

Evaluation

Crew Performance Observations (CPOs) were introduced to PRs (from FY2016)
CPOs evaluate the capability (not training, but actual competence) of the plant operation team that responds to prolonged (2–3 hours), complex trouble in the simulator.



Support

- ◆ Controlling/commanding teams became difficult in prolonged complex trouble
- Each company introduced CPO-level training as TPT (from FY2019; all teams nationwide conduct the training at least once a year)
- JANSI participates in part of it, and continues to provide support that involves conveying findings and other matters
- ◆ When TPT started, there was confusion in responses by teams. Recent years have seen an enhancement in the capability to utilize human performance tools and in the assistant shift supervisor's controlling/commanding ability, and a well-controlled team response is thereby becoming possible.



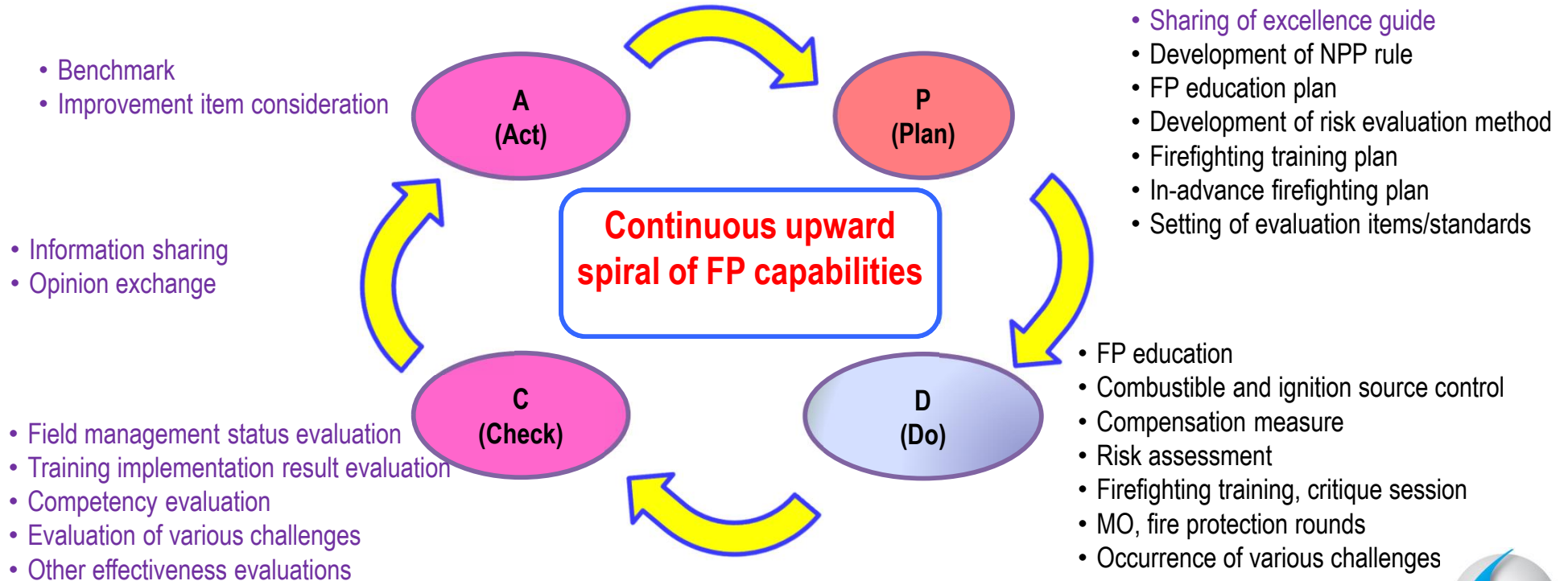
(Photo on the day of TPT)



Fire Protection (FP) Review Meeting

- The **FP Review Meeting** was established in April 2019 as JANSI's meeting body and as a place to exchange opinions centering around NPP FP staff. The meetings are held twice a year.
- The Meeting aims for facilitating both the penetration of excellence and the solving of challenges through sharing good FP practices and operator-JANSI opinion exchanges on the challenges and aims for a **continuous upward spiral of FP capabilities**.

➔ Sharing guides for achieving excellence and rolling out to individual benchmarking activities



5. JANSI's New 10-Year Strategy



New 10-Year Strategy (1/2)

[Revision of 10-Year Strategy]

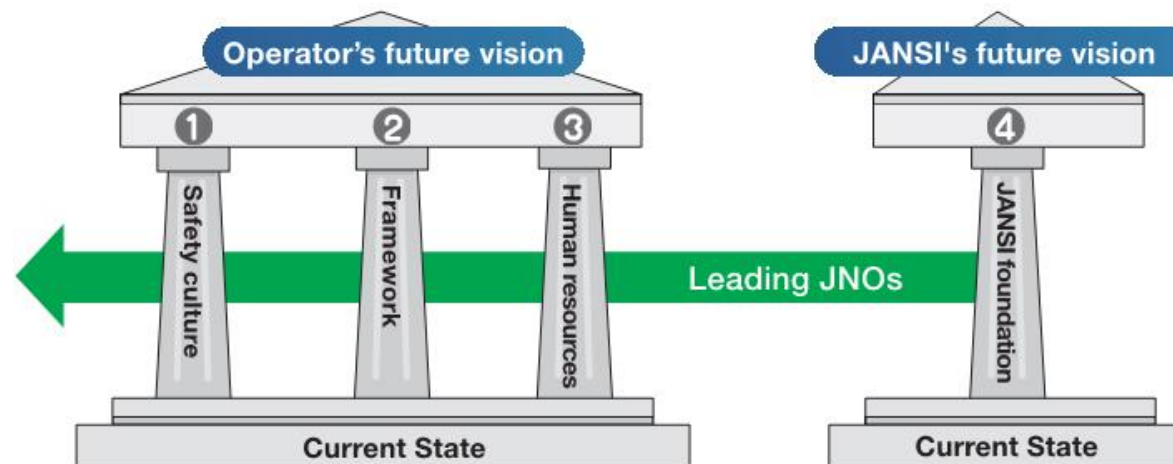
- The current Future Vision was reviewed to revise the 10-Year Strategy in FY2023, the interim year of the existing 10-Year Strategy.
→ Elements important (important success factors) in achieving the Future Vision were identified

Future Vision

- Operators have achieved the world's highest level of safety and reliability, and are maintaining and continuing that state by establishing voluntary and continuous safety improvement initiative.
- JANSI leads operators from an independent standpoint as the authority of world's excellence.

Critical Success Factor

1. Fostering of healthy safety culture
2. Operation of voluntary continuous improvement foundation program
3. Securing/developing personnel necessary for business operations
4. As a self-regulatory organization, enhance/strengthen the foundation of functions, awareness, technical capabilities, etc., and implement effective/efficient activities



New 10-Year Strategy (2/2)

[Revision of 10-Year Strategy]

- Set JANSI's key activities (main actions) that contribute to critical success factors

Critical success factor	Main action
1. Fostering a healthy safety culture	(1) Lead the awareness-raising of operators as the main actors of self-regulation (2) Support safety culture fostering activities (3) Determine/develop organizational effectiveness that maintains and sustains high performance
2. Operating a voluntary continuous improvement foundation program	(4) Pursue the world's excellence (5) Effectively/efficiently implement high-quality PR (6) Maturing and effective utilization of PMCM (Performance Monitoring and Continuous Monitoring) (7) Continuously improve integrated plant assessments (8) Improve OE activities (9) Promptly and appropriately respond to important challenges
3. Securing/developing personnel necessary for business operations	(10) Enhance and implement leadership training, seminars, etc.
4. Enhancing/strengthening the foundation as a self-regulatory organization such as functions, awareness technical capabilities, etc., and implementing effective/efficient activities	(11) Establish foundation as self-regulatory organization (12) Collaborate with domestic and overseas related institutions/organizations and build trusting relationships, etc.
[Important challenges to be addressed in the near future]	(13) Provide support to long-term shutdown plants and their restart (14) Support nuclear fuel cycle facilities
[Other: Tasks separated from main actions]	<ul style="list-style-type: none"> • Task for Operation Supervisors Certification Exam/Accreditation



Maturing and Effective Utilization of Performance Monitoring and Continuous Monitoring (PMCM)

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- JANSI implemented PMCM*¹ at operating NPPs (Mihama, Sendai, Ikata, Ohi, Takahama, Genkai)
- Cooperated with WANO's enhanced performance monitoring (ePM)

*1: PMCM

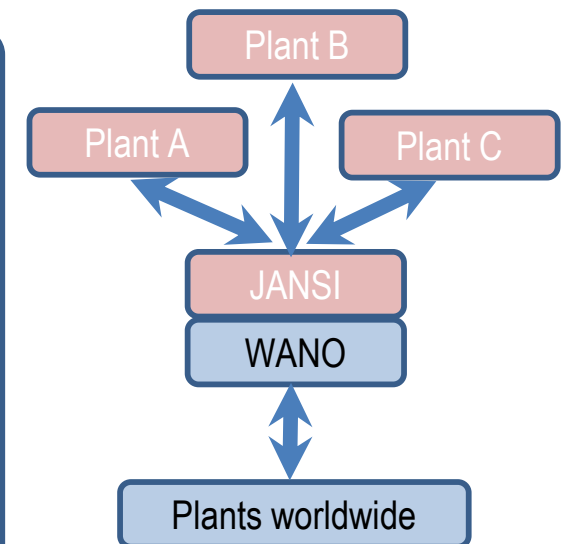
- Routinely identifies NPP performance status based on performance monitoring system data and various information

*2: ePM

- WANO's enhanced performance monitoring

Aim

- Routinely collect NPP performance/factor indicators at each NPP
 - Provide each NPP's data to JANSI
- ↓
- Continuously check performance between PRs by monitoring the trend of indicators and other factors, and by communicating with NPPs
 - Detect deterioration trends early, if any, and support NPP improvement activities
- ↓
- Operators voluntarily promote improvement
 - JANSI comprehensively evaluates and provides support timely based on each field's expert knowledge and experience
 - Support is provided to NPPs effectively and efficiently by coordinating with WANO and incorporating an international perspective



6. Summary

Voluntarily and tirelessly continuing efforts toward excellence is the responsibility of both the nuclear industry and JANSI, and is a promise made for society as well.

Under a mentality to cooperate with the nuclear industry, JANSI will continue to fulfil its mission to lead the voluntary improvement efforts (for the same goals and from an equal standpoint).

JANSI will

- voluntarily, and
- continuously
- pursue excellence



In Closing



(Excerpt from U.S. operator's materials)

Voluntary and continuous improvement of performance

- **Continuous improvement** is much like going uphill on a bike
 - ⇒ **One needs to keep pedaling to move forward**
 - ⇒ Stopping to pedal would inevitably result in falling or moving backward

