

Organizational Life Cycles and Innovation: Comparing IAEA and CTBTO Responses to Fukushima

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Abstract

In the wake of the Fukushima Daiichi nuclear disaster, a small and relatively new organization, the Preparatory Commission for the **Comprehensive Test Ban Treaty Organization (CTBTO)**, went beyond its mission to monitor nuclear tests and offered information about the dispersion of radiation around the world. At the same time, the **International Atomic Energy Agency**, known by the sobriquet, “the UN’s nuclear watchdog,” drew criticism for not providing enough information in a timely fashion to governments, the media, and citizens looking for answers about the extent of the crisis and the threat posed by radiation. The divergent histories and performance of the IAEA and CTBTO raises questions for theories of public organizations. The life cycle tradition in the sociology of organizations predicts that performance suffers in new organizations because they lack experience. Over time, their learning curves increase and they adapt to their environment and develop more efficient routines and trust with stakeholders. In this case, however, the newer CTBTO improvised efficient routines despite limited resources, and quickly developed trust among users, whereas routines and trust among stakeholders stymied the IAEA’s efforts. This case also offers evidence that the CTBTO exercised a form of bureaucratic power appropriate for a dispersed, social media world, against the wishes of states and other organizations.

Organization Theory and Policy

In the policy world, there are **two views**:

- 1) Put the **IAEA at the forefront** of nuclear safety, security, and safeguards by giving it new missions and responsibilities as a global watchdog
- 2) Favor **decentralized, networked arrangements** rather than rationalized control by one organization



The **life cycle tradition** in the sociology of organizations predicts that performance suffers in new organizations because they lack experience. See: Stinchcombe, 1965; Hannan and Freeman. 1984; Carroll & Hannan, 1989; Swaminathan, 1996; Johnson, 2007; Marquis & Huang, 2010; McEvily, Jaffee, & Tortoriello, 2012.



Research Questions

To what degree was each agency mandated and prepared to respond to a nuclear accident?
How did they first learn about the Fukushima crisis, and how did they organize their responses?



A Tale of Two Agencies

Comparison

	IAEA	CTBTO
Founding	Vienna 1957	Vienna 1997
Mission	safe and secure peaceful use	safe and secure peaceful use
Reputation	the UN’s “nuclear watchdog”	scientific and test ban organization
Size	2,474 staff, \$558 million budget	260 staff, \$120 million budget
Legal status	agency statute plus roles and responsibilities under NPT	preparatory commission; Treaty not likely to go into force soon
Inspection authority	standard setting, and inspection power outside safety realm	monitoring stations and some inspections; tsunami warning agreement

Legal Constraints

	IAEA	CTBTO
Authority	reports to member states	reports to member states
Power over information	push towards transparency, but legal and structural constraints	can release relevant radionuclide data, but cannot release data for purposes outside treaty
Legal agreements	early notification and assistance conventions	model facility and tsunami warning agreements

Criticism from a Trusted Source...and Response

“The [CTBTO] data would be of enormous public interest as it would provide a far fuller picture of the extent and spread of any current or future radioactive release from the major Japanese nuclear accident now under way. But none of these data are being released to the public, *Nature* has learned.”

--*Nature* blog, 2011

“Japan and other countries have their own national radiation protection services, but where we could be useful is the worldwide nature of our monitoring network, because countries lack monitoring capabilities outside their own countries. We are the only truly worldwide radionuclide monitoring network.”



--CTBTO executive secretary
Lassina Zerbo

“People wanted to know what was happening. Information was extremely scant. When it became clear the CTBTO had data, there was a very short discussion on whether or not the information—if considered relevant from a technical point of view should be made public—and we said, yes.”

- Alexander Kmentt, director for Disarmament and Arms Control in Austria’s Federal Ministry for European and International Affairs

Response to Fukushima Daiichi Accident (3/11/11)



IAEA

- First ever “full response mode”
- Eventual 24-hour shifts
- “Volunteer” public information, nuclear safety and radiation experts
- Visits to Japan: March 18 + 3 more
- Pleas for more information to agency
- Websites, briefings, 20,000 PowerPoint downloads in 6 weeks

CTBTO

- 274 monitoring stations with 4 technologies: seismometers; infrasound; hydro-acoustic; atmospheric sniffers (radionuclides)
- Built (via contract) models of radioactive dispersion
- More than 600 outlets cite CTBTO data

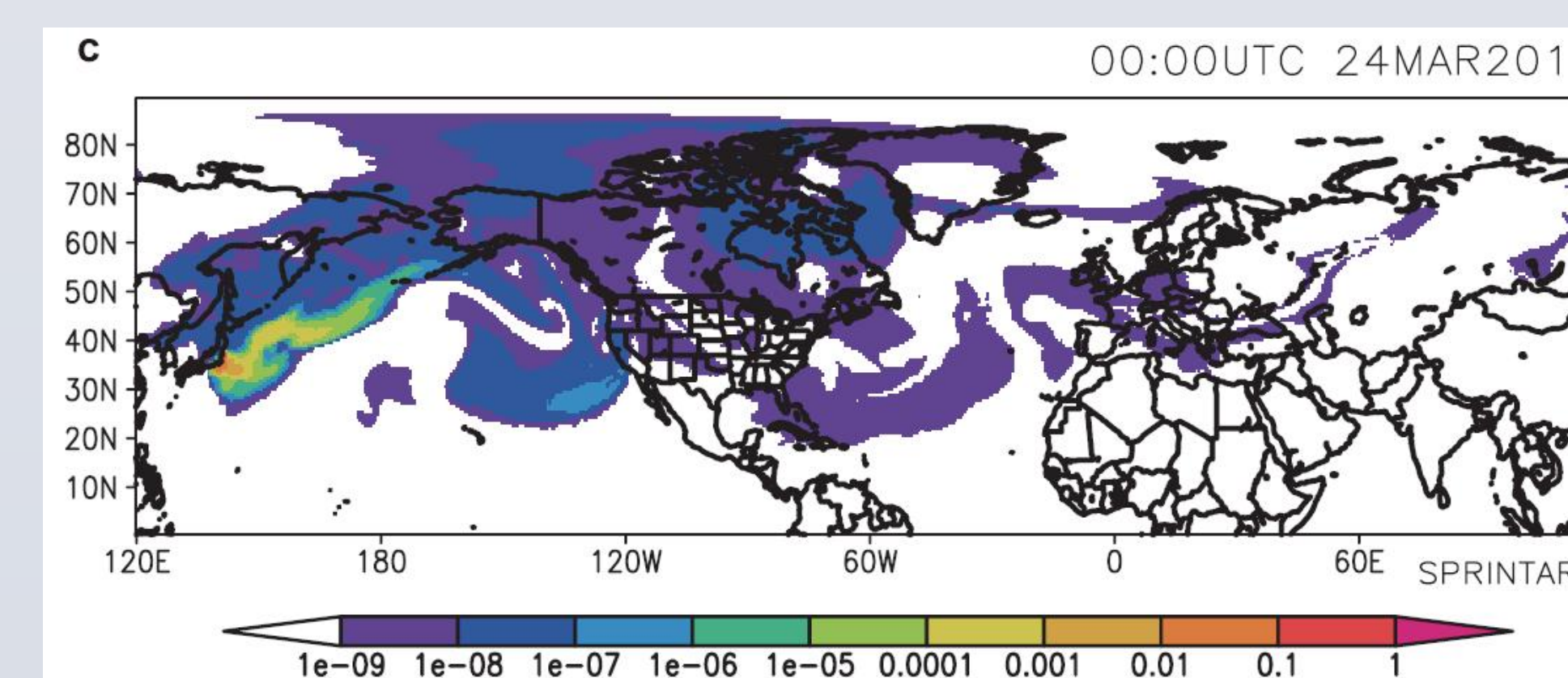


Figure 1. SPRINTARS simulation for March (a) 18, (b) 21 and (c) 24 of near-surface mass concentration of particles emitted continuously from the Fukushima Daiichi Nuclear Power Plant since 1200 UTC, March 14. The concentration indicated is relative to that within a few tens kilometers around the power plant. Each range of color contours corresponds to one order of magnitude.

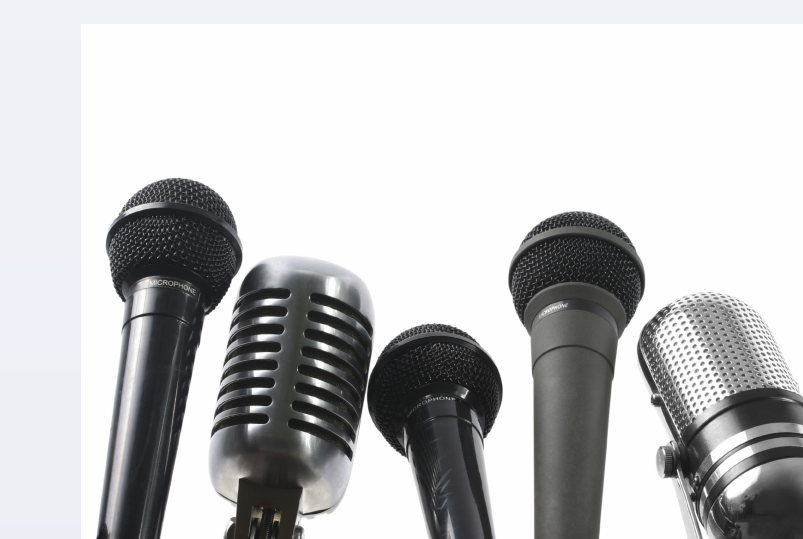
CTBTO vs. States

March 13 US NRC: no “harmful levels of radioactivity” would reach the US from Japan “given the thousands of miles between the two countries.”

March 13-15: US Navy repositions ships

March 15: CTBTO forecasts a radioactive plume drift to California by 18th

“We spent a lot of time with each reporter and it really paid off, with accurate reporting on a massive scale as well as establishing trust with reporters and credibility as an international organization.”



-- CTBTO spokeswoman
Annika Thunborg

CTBTO and Bureaucratic Power

✗ Ability to get someone to do something they would not otherwise do
-- Dahl (1957)

✓ Call attention to a problem using frame, to audience, and at time of its choosing
-- Carpenter (2010)

✓ Influence people not inclined to act according to its wishes
-- Foucault

Conclusion

While the IAEA performed many important functions following the crisis, it did not exceed expectations and its public communication efforts were more limited than some observers wished them to be. Meanwhile, the CTBTO acted outside of its formal mandate to focus attention on the problem of radiological dispersion even in contrast to official pronouncements from the United States and other major powers.

Findings:

- 1) CTBTO improvised efficient routines despite limited resources and quickly developed trust among users
- 2) Routines and trusted stakeholders were obstacles for IAEA

Contact

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