Union of Concerned Scientists

EXECUTIVE SUMMARY

The NRC and Nuclear Power Plant Safety in 2014

Tarnished Gold Standard

OUR FIFTH ANNUAL REPORT CARD

The NRC often claims to be the gold standard for nuclear power plant safety regulation and oversight. Ample evidence suggests much validity to these claims. One cannot count the number of nuclear disasters averted by the NRC's effective regulatory performance, but one can generally count on the NRC to be an effective regulator.

But the NRC's gold standard is tarnished. For the past decade, they have been improperly withholding documents about safety problems, have subjected engineers who voiced safety concerns to repeated investigations of alleged but unsubstantiated wrongdoing, and have been using nonuniform answer keys to grade standardized tests administered via its reactor oversight process.

If the NRC truly is the gold standard, it must restore the luster and prevent the tarnish from recurring.

The Nuclear Regulatory Commission (NRC) often claims to represent the gold standard for nuclear power plant safety regulation and oversight (Macfarlane 2013; Magwood 2013). Ample evidence, including the summaries of positive outcomes achieved by the NRC in this series of annual reports, suggests much validity to these claims. One cannot count the number of nuclear disasters averted by the NRC's effective regulatory performance, but one can generally count on the NRC to be an effective regulator. The NRC has done much to earn the gold standard label.

Chapter 4 of this report describes how the NRC conducted two extensive reassessments of its reactor oversight process—not in response to an accident demonstrating its inadequacy or to criticism suggesting an inadequacy, but as a proactive measure aimed at enhancing the effectiveness and efficiency of the existing process. Chapter 4 also describes how a decade ago the NRC recognized it had an aging work force and developed formal programs to retain as much tribal knowledge as possible before its retirees hit the golf courses and beaches in their golden years. Such proactive actions enable the NRC to retain the gold standard label.

Chapters 2 and 3 of this report describe how the number and severity of near misses at nuclear power plants have been steadily declining since 2010 (Table 1, p. 2), again consistent with the NRC being an effective regulator.

The Millstone Power Station in Waterford, CT, which experienced two self-inflicted near misses in 2014 when recent maintenance and modifications introduced problems that reduced safety margins.

TABLE 1. Near Misses 2010 to 2014

	Reactor	Total Number of Near Misses	Near Misses in 2010	Near Misses in 2011	Near Misses in 2012	Near Misses in 2013	Near Misses in 2014
1	Arkansas Nuclear One Unit 1	2	1			1	
2	Arkansas Nuclear One Unit 2	2	1			1	
3	Braidwood Unit 1	2	1	1			
4	Braidwood Unit 2	2	1	1			
5	Browns Ferry Unit 1	1				1	
6	Browns Ferry Unit 2	1				1	
7	Browns Ferry Unit 3	1				1	
8	Brunswick Unit 1	1	1				
9	Brunswick Unit 2	2	1		1		
10	Byron Unit 1	1		1			
11	Byron Unit 2	2		1	1		
12	Callaway	1		1			
13	Calvert Cliffs Unit 1	2	1				1
14	Calvert Cliffs Unit 2	2	1				1
15	Catawba Unit 1	3	1		1		1
16	Catawba Unit 2	1	1				
17	Clinton	1					1
18	Columbia	3				3	
19	Cooper	1		1			
20	Crystal River Unit 3	1	1				
21	Davis-Besse	1	1				
22	Diablo Canyon Unit 2	1	1				
23	Farley Unit 1	1			1		
24	Farley Unit 2	2	1		1		
25	Fermi Unit 2	1					1
26	Fort Calhoun	4	1		2	1	
27	Grand Gulf	1					1
28	H.B. Robinson	2	2				
29	Joseph M. Farley Unit 2	1					1
30	LaSalle Unit 1	1				1	
31	LaSalle Unit 2	1				1	
32	Millstone Unit 2	2		1			1
33	Millstone Unit 3	2					2

TABLE 1. Near Misses 2010 to 2014 (continued)

	Reactor	Total Number of Near Misses	Near Misses in 2010	Near Misses in 2011	Near Misses in 2012	Near Misses in 2013	Near Misses in 2014
34	North Anna Unit 1	1		1			
35	North Anna Unit 2	1		1			
36	Oconee Unit 1	1		1			
37	Oconee Unit 2	1		1			
38	Oconee Unit 3	1		1			
39	Oyster Creek	1				1	
40	Palisades	3		2	1		
41	Palo Verde Unit 1	1			1		
42	Palo Verde Unit 2	1			1		
43	Palo Verde Unit 3	1			1		
44	Perry	2		1	1		
45	Pilgrim	2		2			
46	River Bend	2			1		1
47	San Onofre Unit 2	1			1		
48	San Onofre Unit 3	1			1		
49	Shearon Harris	2			1	1	
50	Surry Unit 1	1	1				
51	Susquehanna Unit 2	1				1	
52	Turkey Point Unit 3	1		1			
53	Wolf Creek	4	1	1	2		
	Total	81	19	19	18	14	11

The overall number of near misses continues to decline each year, as does the number of affected sites and the severity of events.

SOURCE: UCS.

But Chapter 5 reveals the gold standard to be tarnished. For the past decade, the NRC has been improperly withholding documents, including many about safety problems. By doing so, the NRC deprived the public of legal rights for regulatory decision-making and painted a misleading picture of nuclear safety. Chapter 5 also describes how two NRC engineers who did their duties and voiced safety concerns were subjected to repeated investigations of alleged but unsubstantiated wrongdoing, sending a very clear message throughout the agency that "silence is golden." Finally, chapter 5 explains how the NRC has been using nonuniform answer keys to grade standardized tests administered via its reactor oversight process (Table 2, p. 4), yielding numerical outcomes less predictable than fluctuating gold prices. By improperly withholding many safety problem reports and jiggling the grading of other safety problems, the improving trends may be more fabrication than fact. If the NRC truly is the gold standard of nuclear regulators, it must restore the luster by removing this tarnish and preventing it from recurring.

TABLE 2. Seven Cornerstones of the Reactor Oversight Process

Initiating Events	Conditions that, if not properly controlled, require the plant's emergency equipment to maintain safety. Problems in this cornerstone include improper control over combustible materials or welding activities, causing an elevated risk of fire; degradation of piping, raising the risk that it will rupture; and improper sizing of fuses, raising the risk that the plant will lose electrical power.
Mitigating Systems	Emergency equipment designed to limit the impact of initiating events. Problems in this cornerstone include ineffective maintenance of an emergency diesel generator, degrading the ability to provide emergency power to respond to a loss of offsite power; inadequate repair of a problem with a pump in the emergency reactor-core cooling system, reducing the reliability of cooling during an accident; and non-conservative calibration of an automatic temperature set point for an emergency ventilation system, delaying its startup longer than safety studies assume.
Barrier Integrity	Multiple forms of containment preventing the release of radioactive material into the environment. Problems in this cornerstone include foreign material in the reactor vessel, which can damage fuel assemblies; corrosion of the reactor vessel head; and malfunction of valves in piping that passes through containment walls.
Emergency Preparedness	Measures intended to protect the public if a reactor releases significant amounts of radioactive material. Problems in this cornerstone include emergency sirens within 10 miles of the plant that fail to work; and underestimation of the severity of plant conditions during a simulated or actual accident, delaying protective measures.
Public Radiation Safety	Design features and administrative controls that limit public exposure to radiation. Problems in this cornerstone include improper calibration of a radiation detector that monitors a pathway for the release of potentially contaminated air or water to the environment.
Occupational Radiation Safety	Design features and administrative controls that limit the exposure of plant workers to radiation. Problems in this cornerstone include failure to survey an area properly for sources of radiation, causing workers to receive unplanned exposures; and incomplete accounting of individuals' radiation exposure.
Security	Protection against sabotage that aims to release radioactive material into the environment, which can include gates, guards, and guns. After 9/11, the NRC reduced the discussion of this cornerstone in the public arena.

The NRC's Reaction Oversight Process features seven cornerstones of reactor safety to help inspectors detect problems before they become more serious.

SOURCE: *WWW.NRC.GOV/REACTORS/OPERATING/OVERSIGHT/ROP-DESCRIPTION.HTML.*

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