NUCLEAR INFORMATION AND RESOURCE SERVICE

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Summary of Testimony of Paul Gunter, Director of the Reactor Watchdog Project
before the United States House of Representatives
Committee on Energy and Commerce
Subcommittee on Oversight and Investigations
"A Review of the Reactor Oversight Process"
Monday, June 19, 2006

The public must look to the United States Nuclear Regulatory Commission's (NRC) oversight process to establish and uphold the safety and security standard in the day-to-day operation and maintenance of nuclear power plants through a rigorous process of assessment, inspection and enforcement. While the new Reactor Oversight Process (ROP) represents an improvement over the old Systematic Assessment of Licensee Performance, NIRS does not have confidence that this latest version is being fairly applied to hold the public safety and security in the highest regard.

The public is concerned with evidence that the regulatory agency is cutting corners at safety and security cornerstones under the new process particularly in the areas of assessment, inspection and enforcement.

In view of identified public safety concerns, an effective ROP should not set the bar so high for the burden of proof of a safety problem to be beyond the reach of timely regulatory action so as to first consider the financial interests of a licensee.

The public has no confidence in a Physical Protection Cornerstone of the ROP that is more determined by the regulator's assessment of how much the nuclear industry is willing to afford rather than a set of requirements of what is realistically needed to defend these potential radiological targets against existing threats.

Under both the old and new ROP, non-compliance with critical fire protection regulations for the safe shutdown of the reactor in the event of fire has lingered unresolved for more than a decade without resolution and without federal enforcement action to require compliance.

Congressman Dingell stated the obvious at that 1993 hearing on fire protection non-compliances and the NRC oversight process more than 13 years ago, *"One must inquire whether a regulatory process which approves matters as a matter of courtesy is serving the public interest or, in fact, whether it is in fact a regulatory system. The question is, how does this happen. It results from a curious blind faith of NRC regulators and assurances made by utilities and by the industries that they regulate."*

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Good afternoon. My name is Paul Gunter. I am Director of the Reactor Watchdog Project for Nuclear Information and Resource Service in Takoma Park, Maryland.

I want to thank you for the opportunity to share with you today some of the public interest community's insights and concerns with the Nuclear Regulatory Commission's current Reactor Oversight Process.

Whether you are for or against nuclear power, we can all agree that safety and security must be regarded as top priorities at all of the nation's atomic power plants. It is all the more true with aging reactors in the Post September 11th world where safety margins and the security bar must be regarded with the highest standard.

Today, the public must look to the United States Nuclear Regulatory Commission's (NRC) oversight process to establish and uphold that standard in the day-to-day operation and maintenance of nuclear power plants through a rigorous process of assessment, inspection and enforcement. Unfortunately, we do not have confidence that the latest version of the oversight process is being fairly applied to hold our safety and security in the highest regard.

Following the Three Mile Island accident in 1979, NRC developed the Systematic Assessment of Licensee Performance. A significant drawback to the SALP process was the fact that the program did not have a rating for unacceptable performance. Following a near-miss accident in 1985 at Ohio's Davis-Besse nuclear power station, NRC established a "Watch List" of reactors that warranted heightened safety-related regulatory attention. Public confidence steadily eroded under the old SALP where reactors like the two units at the Dresden nuclear power station outside of Chicago were allowed to remain on the agency's "Watch List" for eight years of an eleven year period all the while NRC management knew that reactor safety margins were significantly eroded. As the U.S. General Accounting Office pointed out, "*NRC has not taken aggressive enforcement action to force the licensees to fix their long-standing safety problems on a timely basis. As a result, the plant's condition has worsened, making safety margins smaller*." [1]NRC

[1] U.S. General Accounting Office, "Nuclear Regulation: Preventing Problem Plants Requires More Effective NRC Action," GAO/RCED-97-145, May 1997, pp. 2-3

senior management's repeatedly failure to address declining safety performance at nuclear reactors eventually emerged on the cover of TIME magazine.[2]

In April 2000, NRC implemented the current reactor oversight process. In the view of industry the revision of the oversight process came about as the result of improved reactor performance and the need to remove overly burdensome regulatory oversight process. In the view public interest and safety groups the revised process was necessitated by the repeated failure of NRC management to address documented and declining reactor safety performance.

The obvious question today is whether or not we have a better reactor oversight process that accurately assesses reactor safety and security conditions, timely captures problems without gambling public safety and security and carries out enforcement actions to assure that problems are effectively remedied and not recurring. The Reactor Oversight Process is only as effective as the agency is able and willing to accurately assess safety and security problems and take timely enforcement action when violations occur and problems are not addressed.

The public is concerned with evidence that the regulatory agency is cutting corners at a safety and security cornerstones under the new process particularly in the areas of assessment, inspection and enforcement.

Cutting Corners in Reactor Safety and the Barrier Integrity Cornerstone

In March 2002, the Davis-Besse nuclear generating station, 20 miles outside of Toledo, Ohio had <u>not</u> <u>one</u> greater-than-Green performance indicator or inspection finding when the worst reactor safety condition in the United States since the Three Mile Island accident was discovered. The public became acutely aware with the discovery of the severely corroded hole-in-the-head of the Davis-Besse reactor pressure vessel that a lack-of-greater-than-Green finding under the new Reactor Oversight Process does not necessarily equate to an assurance of safety. In fact, disturbing photographic evidence of extensive corrosion was available to the NRC oversight process when the reactor was allowed to restart in April 2000, the same month that the new ROP was initiated.

The NRC technical staff had, in fact, identified a potentially significant safety issue at Davis-Besse where six of the seven operating Babcox & Wilcox reactors had received inspections identifying cracking in a susceptible material that fabricated the control rod drive mechanism penetration sleeves. Davis-Besse was the only other B&W reactor not inspected. An Order was drafted and finalized in November 2001 by the staff of Nuclear Reactor Regulation to shut down the reactor in December 2001 for a safety inspection of the reactor vessel head. However, the final Order was never issued. When the reactor was shut down in February 2002, not only did the operator find cracking in the identified trouble spot but corrosive reactor coolant had been leaking through the crack over an extended time period and eaten a cavity into the reactor vessel head through six and three quarter inches of carbon steel. A federal laboratory study postulated

[2] A Special Investigation "Blowing the Whistle on Nuclear Safety: How a showdown at a power plant exposed the federal government's failure to enforce its own rules," TIME, March 4, 1996, pp. 46-54.

that if the corrosion rate had been allowed to continue for as little as two additional months the reactor pressure vessel may have ruptured.

A subsequent investigation by the NRC Office of Inspector General (OIG) concluded that *"during its review of the potentially hazardous condition at Davis-Besse, the NRC staff considered the financial impact to the licensee of an unscheduled plant shutdown"* and "*was contrary to the goal of NRC Bulletin 2001-01 to have at risk reactors conduct timely inspections to ensure that NRC regulatory requirements related to reactor coolant leakage were met."*[3] The OIG went on to state that *"With respect to Davis-Besse specifically, OIG reviewed a November 21 2001 internal NRC memorandum related to a discussion between the NRR* (Nuclear Reactor Regulation) *Director and the FENOC* (First Energy Nuclear Operating Corporation) *President. The document conveyed that the NRR Director had spoken to the FENOC President and was aware of the licensee's financial concerns pertaining to an unscheduled shutdown. According to the memorandum, the FENOC President told the NRR Director that the impact of a shutdown prior to February 2002 would be significant, and Davis-Besse would be better positioned for a shut down in February because of the availability of replacement fuel. The FENOC President confirmed to OIG that this discussion took place."* [4] The NRC Order was subsequently pulled.

Moreover, the OIG also reported that, "*NRC appears to have informally established an unreasonably high burden of requiring absolute proof of a safety problem, versus lack of reasonable assurance of maintaining public health and safety, before it will act to shut down a power plant. The staff articulated this standard to OIG as a rationale for allowing Davis-Besse to operate until February 16, 2002, even in light of information that strongly indicated Davis-Besse was not in compliance with NRC regulations and plant technical specifications and may have operated with reduced safety margins.*"[5]

In view of such public safety concerns, an effective Reactor Oversight Process should not set the bar so high for the burden of proof of a safety problem to be beyond the reach of timely regulatory action so as to first consider the financial interests of an operator.

The tendency for NRC to overlook significant safety warnings signs under the current ROP remains a concern to the public interest community today.

Cutting Corners in Safeguards and the Physical Protection Cornerstone

Along the same lines, the security bar for nuclear power stations should not be set so low so that Reactor Oversight Process performance indicators can not accurately assess the adequacy of reactor site security to defend against a terrorist attack and assess site vulnerabilities in need of timely resolution.

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[3] U.S. Nuclear Regulatory Commission, Office of Inspector General, "NRC's Regulation of Davis-Besse Regarding Damage to the Reactor Vessel Head," Case No. 02-03S, December 30, 2002, p. 23
[4] Ibid, OIG, p.17
[5] Ibid, OIG, p.23

For example, testimony given this year by the Government Accountability Office (GAO) before the Subcommittee on National Security, Emerging Threats, and International Relations in the House Committee on Government Reform, raises concerns about the Reactor Oversight Process and the Design Basis Threat (DBT), which sets the thresholds for adversary characteristics that reactor sites are required to be able to defend against with a high degree of confidence.[6]

The GAO looked at the rigor of inspections and drills used to test security force readiness that determine the findings of the Physical Protection Cornerstone. GAO identified that NRC staff analyzed intelligence information in determining adversary characteristics including weapons that could be used in an attack as well as exchanged information with the Department of Energy, which has a DBT for comparable facilities that process or store radiological materials and as such are potential targets for radiological sabotage. GAO found that "*NRC generally established less rigorous requirements than DOE—for example, with regard to the types of equipment that could be used in an attack. The DOE DBT includes a number of weapons not included in the NRC DBT. Inclusion of such weapons in the NRC DBT for nuclear power plants would have required plants to take substantial security measures*."[7]

The GAO report reflects the concern of a broad range of public interest groups that the DBT as measured under the current Reactor Oversight Process does not reflect staff recommendation as formulated from intelligence information. Instead, GAO found "*the NRC staff made changes to some recommendations after obtaining feedback from stakeholders, including the nuclear industry, which objected to certain proposed changes, such as the inclusion of certain weapons. NRC officials said the changes resulted from the further analysis of intelligence information. Nevertheless, GAO found that the process used to obtain stakeholder feedback created the appearance that changes were made based on what the industry considered reasonable and feasible to defend against rather than on what an assessment of the terrorist threat called for*."[8]

The public has no confidence in a Physical Protection Cornerstone of the ROP that is more determined by the regulators assessment of how much the nuclear industry is willing to afford rather than a set of requirements of what is realistically needed to defend these potential radiological targets against existing threats.

Cutting Corners in Reactor Safety and Mitigating Systems Cornerstone

As stated on the NRC website with regard to the Reactor Safety and Mitigating Systems Cornerstone **"***The objective of this cornerstone is to monitor the availability, reliability, and capability of systems that mitigate the effects of initiating events to*

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[6] U.S. Government Accountability Office (GAO), "Nuclear Power: Efforts Made to Upgrade Security, but the Nuclear Regulatory Commission's Design Basis Threat Process Should be Improved," April 4, 2006,
[7] Ibid, GAO, p. 9
[8] Ibid, GAO, Introduction

prevent core damage. Licensees reduce the likelihood of reactor accidents by maintaining the availability and reliability of mitigating systems."[9]

Fire is potentially one of the highest risk initiating events. NIRS has long been concerned with the regulatory oversight process and specifically the protection of electrical cables for control, power and instrumentation equipment necessary to safely shut down the reactor in the event of fire. A nearly catastrophic fire that burned for seven hours at the Browns Ferry nuclear power station in 1975 resulted in the promulgation of new requirements for NRC's fire code.

We remain concerned with the questionable adequacy of the Reactor Oversight Process for post-fire safe shutdown requirements, today.

In 1992, NRC declared Thermo-Lag 330-1 fire barriers inoperable. Thermo-Lag 330-1 was then the most widely deployed fire barrier system used throughout the nuclear power industry. An industry whistleblower had exposed that the fire barrier wrap system could not pass standardized industry fire tests and did not meet the fire endurance requirements for protecting safe shut down electrical cables from fire damage, specifically where redundant safe shut down electrical systems were co-located in the same fire zone and could be destroyed by a single fire.

In March 1993, this Subcommittee held a hearing on "Fire Safety at Nuclear Power Plants" then chaired by Congressman John Dingell. I attended that hearing on behalf of Nuclear Information and Resource Service with particular concern for public safety involving the inoperable fire barrier wrap system.

Congressman Dingell stated at that hearing *"This is what Yogi Berra might describe as déjà vu all over again*."[10] As Congressman Dingell further stated, *"The regulators, again appear to have exhibited some substantial failures in regulatory oversight, in passivity and in paralyses."*[11] Congressman Dingell went on to say, *"NRC accepted the utility's assurances, apparently without adequate scrutiny, and the material* (Thermo-Lag 330-1) *was installed in about 80 reactors across the country. The committee has received serious allegations that these result in substandard fire protection in those plants. The certifications continue to be accepted by NRC, in spite of the fact that NRC staff was given ample evidence of problems over a period extending over ten years."*

The bogus fire barrier resulted in NRC staff reviews and repeated meetings for five more years with nuclear power plant operators and the industry lobby group, then Nuclear Utility Management and Resources Council (NUMARC) and now the Nuclear

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[9] http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/cornerstone.html#MS

[10] "Fire Safety at Nuclear Power Plants," Hearing before the Subcommittee on Oversight and Investigation of the Committee on Energy and Commerce, House of Representatives, One Hundred Third Congress, March 3, 1993, Serial No. 103-21, p. 1

[11] Ibid, p.1

Energy Institute. During that time, fire watches, as compensatory measures, were put in place for what would amount to more than six years at some sites despite the 1993 testimony by then Commissioner Ivan Selin before the same Subcommittee on Oversight and Investigations stating that fire watches were only intended for temporary durations of 6 to 9 months. "*They don't expect them for 2 years fulltime,"* said Selin.[12] During that extensive period of non-compliance many operators came to agreements with NRC staff to bring reactor fire protection violations into compliance with the applicable fire code (10 CFR 50.48 and 10 CFR 50 Appendix R III.G.2). About two dozen units were finally issued NRC Confirmatory Action Orders in 1998 to come into compliance by 2000 because of their inability to provide an acceptable and timely corrective action program for the inoperable fire barriers.

In 2000, the NRC implemented the new Reactor Oversight Process which included a series of systematic inspections of licensees' safe shutdown capability. A series of baseline fire protection inspections were conducted at reactor sites by NRC inspectors. During these baseline inspections, NRC inspectors discovered that many licensees had in fact not upgraded or replaced inoperable Thermo-Lag 330-1 fire barriers as agreed to NRC staff in their Thermo-Lag Corrective Action Programs and Confirmatory Action Orders. Between 1998 and 2001, licensees that received NRC Orders sent NRC letters indicating completion of the ordered Thermo-Lag corrective action. To date, those Orders remain in effect, neither rescinded nor relaxed. What has happened to the enforcement of those Orders under the Reactor Oversight Process?

We now know that instead of complying with Thermo-Lag Action Programs and Confirmatory Orders, licensees widely substituted "operator manual actions" that were in large part unreviewed and unapproved by NRC staff. These industry self-initiated manual actions allowed electrical circuits required under regulations as to be maintained free from fire damage to be sacrificed in the fire by taking no action on installing compliant fire barriers or establishing a minimum cable separation between redundant systems. The operator manual actions would instead send station personnel to the end piece of safety equipment and manually operate it or turn off spurious operations. The manual actions can be complicated, multi-tasked and require tools, ladders, key cards and even breathing apparatus to accomplish safety-related functions under duress of fire and potentially even attack. Given the difficulty in predicting fire behavior, the manual actions might not be achievable.

Enforcement Discretion and non-cited violations for non-compliances were put into place by NRC for unapproved operator manual actions. In 2005, NRC initiated a rulemaking to codify operator manual action in lieu of coming into compliance with physical fire protection design features; rated and operable fire barriers and minimal separation requirements used in conjunction with detection and automated suppression. After failing to get an endorsement from either the nuclear industry or the public interest community, NRC abandoned the rulemaking effort in March 2006.

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[12] Ibid, p. 110.

NRC is now planning to accept "feasible and reliable" Operator Manual Actions as "temporary" compensatory actions (an additional three years on top of non-compliances going back to 1992) for inoperable fire barriers and failure to provide minimum cable separation while licensees to submit a large number of exemptions from fire protection requirements and move to a voluntary risk-informed and performance-based fire protection system.[13] The public lacks confidence in such analytical fire protection over physical fire protection features. To offer one basic reason for this lack of confidence, fire protection is fundamental to the security infrastructure in protecting the public from radiological sabotage. Terrorism can neither be effectively risk-informed or performance-based.

In the mean time, there is the recurrence of the Thermo-Lag "déjà vu all over again" with additional inoperable fire barrier system materials widely employed by the nuclear industry for protection of safe shut down electrical systems having been identified.[14] HEMYC and MT fire barriers, are now demonstrated to dramatically fail the same standardized fire tests and do not assure that safe shut down equipment can be maintained free from fire damage in the event of a significant fire at a U.S. reactor. NRC has set about to take regulatory action along the same paths as its 1992 discovery of inoperable Thermo-Lag barriers that remain an unresolved problem today under the new Regulatory Oversight Process. Given the unresolved nature of the problem created by inoperable Thermo-Lag, the public has little cause to have confidence that the current Regulatory Oversight Program will find closure any time sooner for HEMYC / MT fire barriers.

Congressman Dingell stated the obvious at that 1993 hearing on fire protection and the NRC oversight process more than 13 years ago, *"One must inquire whether a regulatory process which approves matters as a matter of courtesy is serving the public interest or, in fact, whether it is in fact a regulatory system. The question is, how does this happen. It results from a curious blind faith of NRC regulators and assurances made by utilities and by the industries that they regulate."*[15]

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[13] NRC Regulatory Issue Summary 2006-XX, Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions, Public Meeting, June 6, 2006

[14] NRC Generic Letter 2006-03, "Potentially Nonconforming HEMYC and MT Fire Barrier Configurations," April 10, 2006, United States Nuclear Regulatory Commission, Accession No. ML053620142.

[15] Ibid, Subcommittee Hearing, p.2