THE NRC'S REVISED SECURITY REGULATIONS

On January 29, 2007, the Nuclear Regulatory Commission (NRC) voted 5-0 to revise its security regulations to better protect nuclear power plants following the 9/11 tragedy. NRC Chairman Dale Klein's formal statement about the agency's ruling began with these two sentences:

> *Nuclear power plants are inherently robust structures that our studies show provide adequate protection in a hypothetical attack by an airplane. The NRC has also taken actions that require nuclear power plant operators to be able to manage large fires or explosions – no matter what caused them.*[1]

This issue brief examines the Chairman's two sentences.

① *"Nuclear power plants are inherently robust structures that our studies show provide adequate protection in a hypothetical attack by an airplane."* Really? What studies show that? Certainly not any of these publicly available studies:

- In the spring of 1982, the owners of the Indian Point nuclear plant outside New York City submitted a report to the NRC documenting risk assessments of the internal and external hazards at the facility.[2] Section 7.6.2 of this report covered the analysis of the threat to the facility posed from the accidental crash of an aircraft. The assessment considered aircraft postulated to crash into various spots and concluded:

  - *Most of the [spots] would be protected from a direct hit by a low trajectory northerly or southerly bound aircraft by a larger building, such as the turbine, containment, or primary auxiliary buildings. The control building is the only single building which, if hit, could lead to core melt.* (page 7.6-3)

  THIS study documented the existence of a structure at a nuclear power plant that failed to provide adequate protection against aircraft attack.

- In June 1982, the NRC published a report on a study of aircraft crash hazards conducted for the agency by researchers at the Argonne National Laboratory.[3] This report stated:

  - *The major threats associated with an aircraft crash are the impact loads resulting from the collision of the aircraft with power plant structures and components and*

[1] Nuclear Regulatory Commission News Release No. 07-013, "Statement from Chairman Dale Klein on Commission's Affirmation of the Final DBT Rule," January 29, 2007.
[2] Power Authority of the State of New York and the Consolidated Edison Company, "Indian Point Probabilistic Safety Study," Spring 1982.
[3] Nuclear Regulatory Commission, NUREG/CR-2859, "Evaluation of Aircraft Crash Hazards Analyses for Nuclear Power Plants," June 1982.

the thermal and/or overpressure effects which can arise due to the ignition of the fuel carried by the aircraft. (page 5)

- *The results of an aircraft crash on a nuclear power plant are not limited to the effects of the impact of heavy parts (such as a jet engine) on civil engineering structures. Numerous systems are required in order to provide reactor shutdown and adequate long-term cooling of the core. Although many of these safety-related systems are well protected within hardened structures (containment system, auxiliary building), some are not.* (page 50)

- *An aircraft crash on a PWR nuclear power plant resulting in rapid depressurization of the plant's secondary cooling system, combined with total loss of electrical power (impact on the turbine building and the switchyard), would result in an accident sequence in which the fission power in the core would remain at some considerable level. … Furthermore, since the loss of electrical power and the damage to the secondary system would preclude any cooling other than short-term boil-off of the primary coolant inventory, the core would most probably be headed for serious damage if not total meltdown.* (pages 51-52)

- *Note that the above sequence of events does not depend in any way on the breach of a hardened structure due to the impact of a heavy segment of the aircraft at some optimum (i.e., most-damaging) angle, which seems up to now to have had the greatest attention in the evaluation of nuclear power reactor safety with respect to aircraft crashes.* (page 52)

- *The effect [on plant structures] due to the impact of the Boeing 707-320 at 103 m/s [meters per second, or 230 miles per hour] is clearly more severe than that due to an earthquake.* (page 70)

- *If only one percent of the fuel, say 500 lb [pounds] for the FB-111 fighter plane, is involved in such as event, the blast environment will be equivalent to the detonation of approximately 1000 lb of TNT. … For the above explosion the "safe" overpressure of 1 psi [pound per square inch force] will exist at a range of approximately 120 m [meters, or 393 feet or 131 yards, an oversized football field].* (pages 76-77)

THIS study clearly, categorically, explicitly, and undeniably refutes the fanciful notion that nuclear power plants are robust structures and describes numerous scenarios in which an aircraft crash could lead to significant reactor core damage.

- In March 1987, the NRC formally notified all nuclear plant owners about several unexpected consequences from a December 1986 event at the Surry nuclear plant in Virginia.[4] An 18-inch pipe in the turbine building carrying water from the main condenser to the steam generators ruptured, killing four workers in the vicinity. The unanticipated consequences from the pipe rupture the NRC warned plants owners about included:

[4] Nuclear Regulatory Commission, Information Notice No. 86-106 Supplement 2, "Feedwater Line Break," March 18, 1987.

- *Condensed steam saturated a security card reader in the turbine building basement approximately 50 feet from the failed pipe and shorted out the card reader system for the entire plant. As a result, key cards would not open doors controlled by the security system.* (page 1)

- *Water also entered a fire protection control panel through an open conduit and shorted circuits in the panel. This resulted in the discharge of 68 water sprinkler heads in the fire suppression system within minutes of the failure of the feedwater piping. … Water from the sprinklers outside the Unit 2 cable tray room apparently flowed under the doors into the cable tray room, leaked around foam fire seals in floor penetrations, and dripped into the control room. … A carbon dioxide fire suppression system is provided for the cable tray rooms. Water from sprinkler heads located directly over and adjacent to control panels for this system and water from the failed feedwater pipe entered the control panels through the ends of several open conduits. Within a few minutes after failure of the feedwater pipe, shorting of the fire protection control circuits caused the contents of the main carbon dioxide storage tank to be emptied into the cable tray rooms leaving the station without carbon dioxide in event of fire. Carbon dioxide, which is heavier than air, entered the control room via stairwells and controlled-access doors which were blocked open. Personnel in the Unit 2 side of the control room complained of shortness of breath, dizziness, and nausea.* (pages 1-2)

- *An operator who was in the stairwell behind the control room when the card readers failed experienced difficulty in breathing. Because of locked doors, he could not exit through the control room or a switchgear room which contained halon. The other means of egress was through a cable tray room which contained carbon dioxide. An operator in the control room heard him knocking and admitted him.* (page 2)

- *The security communications system includes radio repeaters that improve the clarity of reception of low-pager hand-held radios used in the plant. A radio repeater, located in the Unit 1 cable tray room and approximately 5 feet from a carbon dioxide nozzle, was covered with a thick layer of ice as a result of cooling from the discharge of carbon dioxide. The performance of the radio repeater was temporarily degraded.* (page 2)

THIS study demonstrates that real-world consequences from nuclear plant accidents can be significantly more severe than predicted by hypothetical ivory-tower surmises. The response of workers and equipment to this event at Surry was unexpectedly impaired by "collateral damage" caused by the initial pipe break. It's not hard to predict that the "collateral damage" from an aircraft crash might be worse than from one broken pipe.

- In August 1987, the NRC published the results from a study it commissioned on the effects of earthquake forces on relays (electrical switches) at a nuclear power plant.[5] This study is relevant because, as the 1982 aircraft crash hazards study reported, an aircraft impact can produce effects equal to or greater than those resulting from earthquakes. The

[5] Nuclear Regulatory Commission, NUREG/CR-4910, "Relay Chatter and Operator Response After a Large Earthquake," August 1987.

study postulated a large earthquake affecting the Zion and LaSalle nuclear plants in Illinois. The vibrations associated with the earthquake could be severe enough to cause the relays to switch from the opened to closed position, from the closed to opened position, or even cycle back and forth between positions. The relay repositioning would cause operating equipment to stop and standby equipment to start. The study identified potential scenarios resulting from postulated earthquakes, called minimum cut sets, and assessed the consequences on plant equipment from the scenarios. The study concluded:

- *The number of min cut sets found at LaSalle-2 is so large that, given an earthquake strong enough to cause LOSP [loss of offsite power], the probability that at least one of these cut sets will occur is very high. For the peak response case, this probability is essentially 100% assuming that the relays and switches chatter with the fragility functions and response behavior we have assumed. For the predicted-response case, the probability is about 30%, meaning that in the absence of operator recovery, the value of the computed core-damage frequency, given LOSP and chattering, is approximately 1/3 of the recurrence frequency of the earthquake strong enough to cause LOSP.* (page 6-5)

THIS study strongly suggests that the violence of an aircraft crashing into a nuclear plant structure can produce shaking that causes electrical relays to change positions and this outcome alone – without even considering the effect of fires or explosions or other consequences – has a high likelihood of causing reactor core damage.

- In June 1997, the NRC formally notified all nuclear plant owners about unexpected consequences from a March 1997 event at the Pilgrim nuclear plant in Massachusetts.[6] The NRC warned:

  - *A fault in the main transformer caused severe mechanical agitation [translation – it shook violently], breaking one of the low-voltage bushings and one of the high-voltage lightning arresters. Oil leaked out of the broken low-voltage bushing and spilled into the turbine building via the isolated phase (iso-phase) bus duct.* (page 1)

  - *Approximately 4,300 gallons of oil entered the turbine building. Some oil leaked under the doors to the A essential switchgear room and into some nonsafety-related electrical cabinets but stopped short of safety-related switchgear.* (page 1)

  - *If the transformer fault at Pilgrim had occurred at power [the reactor was shut down for refueling at the time], a serious turbine building fire could have ensued. … Smoke and hot gases could have entered the B essential switchgear room (located on the next level above the fire) via the ventilation wall opening. Oil seeping under the door to the A essential switchgear room could have allowed the fire to spread to that room and could have resulted in the loss of the A switchgear as well [there is no C switchgear at Pilgrim].* (pages 2-3)

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[6] Nuclear Regulatory Commission, Information Notice No. 97-37, "Main Transformer Fault with Ensuing Oil Spill into Turbine Building," June 20, 1997.

THIS study demonstrates how little combustible material it takes to cause major problems at an allegedly robust nuclear power plant. The introduction of 4,300 gallons of oil could have caused the plant to lose offsite and onsite ac electrical power, leaving it dependent solely on battery power and hope that the damaged offsite or onsite power could be restored before the 4-hour capacity batteries depleted. A Boeing 737 aircraft carries about 3,500 gallons of fuel while a Boeing 747 aircraft can carry over 50,000 gallons of fuel.[7]

- In October 1997, NRC staffers presented a paper at the agency's own reactor safety conference about assessments of fire risks at nuclear power plants.[8] This paper included data from nearly two dozen nuclear power reactors comparing the estimated risk of reactor core damage posed by a fire to the estimated risk of reactor core damage from all causes, including fire. They reported that fire represented, on average, about 25 percent of the overall reactor core damage risk. The risk varied from plant to plant, with one the fire risk at one reactor more than double the risk from all other hazards combined (71.4 percent of reactor core damage risk from fire vs. 28.6 percent from all other causes combined). This paper also reported that the most commonly identified plant areas with high fire vulnerabilities were the main control room, the electrical switchgear rooms, and the cable spreading rooms – all areas located outside of the thick, reinforced concrete containment walls.

  It is important to note that the fire hazard analyses yielding the risk numbers cited above all assumed that the postulated fires were (a) confined to a single room or discrete area and did not propagate into adjacent areas and (b) consumed combustible materials pre-existing in the room or area. The fire resulting from an aircraft crash can invalidate both of these assumptions by initiating fires in multiple rooms and by introducing considerable more combustible material (i.e., jet fuel) into the situation. Consequently, the fire hazard from an aircraft crash would very likely be significantly higher than reported in this NRC paper.

  THIS study shows that the allegedly robust nuclear power plant structures are extremely vulnerable to fires from within. Any one seeing the World Trade Center towers collapse – not from the aircraft impact but from the ensuing fires weakening load-bearing supports – grasps this point.

- In March 2000, the NRC asked the owner of the Turkey Point nuclear plant in Florida questions following the agency's review of an analysis of the potential impact of expanded aircraft operations at the nearby Homestead Air Force Base. In May 2000, the owner submitted its response to the NRC.[9] Within its response, the owner informed the NRC about analyses it had conducted for postulated aircraft impacts on various plant structures with the potential for that postulated impact to lead to fuel damage (abbreviated as CCDP, conditional core damage probability). The NRC was told:

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[7] Boeing's website on January 31, 2007.
[8] N. Siu, J. T. Chen, and E. Chelliah, Nuclear Regulatory Commission, "Research Needs in Fire Risk Assessment," Presentation at 25th Water Reactor Safety Information Meeting, Bethesda, Maryland, October 20-22, 1997.
[9] Letter dated May 1, 2000, from R J. Hovey, Vice President – Turkey Point Plant, to Nuclear Regulatory Commission, "Response to Request for Information Regarding the Potential Risk of the Proposed Civil and Government Aircraft Operations at Homestead Air Force Base on the Turkey Point Plant."

Structure	CCDP	CCFP	CCDPxCCFP
Containment Unit 3	10 percent	100 percent	10 percent
Containment Unit 4	10 percent	100 percent	10 percent
Control Building	50 percent	10 percent	5 percent
Turbine building Unit 3 and 4	10 percent	10 percent	1 percent
Auxiliary Building Unit 3 and 4	100 percent	25 percent	25 percent
Spent Fuel Building Unit 3	50 percent	100 percent	50 percent
Spent Fuel Building Unit 4	50 percent	100 percent	50 percent
Emergency Diesel Generator Building Unit 3	10 percent	50 percent	5 percent
Emergency Diesel Generator Building Unit 4	10 percent	50 percent	5 percent
Intake Structure	50 percent	50 percent	25 percent

The results make intuitive sense. CCDP represents the probability, or chance, that the postulated aircraft impact results in fuel damage while CCFP represents the chance the postulated aircraft impact causes the containment to fail. An aircraft impacting the Unit 3 or Unit 4 containment structure or the Unit 3 or Unit 4 spent fuel building has a high chance of failing containment for the fuel inside since those structures are the containment. But failing those structures does not guarantee damage to the fuel inside. An aircraft impacting the Unit 3 or Unit 4 auxiliary building has a high chance of causing reactor core damage, since all of the safety systems preventing such an outcome are located within or pass through the auxiliary building. But causing that outcome does not guarantee failure of the applicable containment structure.

The largest hazard would be the event(s) with the highest chance of resulting in both fuel damage and containment failure, or CCDP x CCFP. According to Turkey Point's owner, the top risks are a strike on the Unit 3 spent fuel building (50 percent), a strike on the Unit 4 spent fuel building (50 percent), a strike on the auxiliary building (25 percent), and a strike on the intake structure (25 percent). The oft-cited threat of an aircraft hitting the containment dome is relatively low risk (10 percent).

THIS study reveals that the allegedly robust nuclear power plant structures cannot be reasonably guaranteed to provide adequate protection against aircraft attack.

- In October 2000, the NRC released a study of the spent fuel pool hazard at nuclear power plants undergoing decommissioning.[10] One of the hazards examined for this study was the accidental crash of aircraft into buildings housing spent fuel pools. The report stated:

  - *In estimating the frequency of catastrophic PWR spent fuel pool damage from an aircraft crash (i.e., the pool is so damaged that it rapidly drains and cannot be refilled from either onsite or offsite resources), the staff uses the point target area model and assumes a direct hit on a 100 x 500 foot spent fuel pool. Based on studies in NUREG/CR-5042, "Evaluation of External Hazards to Nuclear Power Plants in the United States," it is estimated that 1 of 2 aircrafts are large enough to penetrate a 5-foot-thick reinforced concrete wall. The conditional probability*

[10] Nuclear Regulatory Commission, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," October 2000.

that a large aircraft will penetrate a 5-foot-thick reinforced concrete wall is taken as 0.45 (interpolated from NUREG/CR-5042). It is further estimated that 1 of 2 crashes damage the spent fuel pool enough to uncover the stored fuel (for example, 50 percent of the time the location of the damage is above the height of the stored fuel). (page 3-23)

THIS study also reveals that the allegedly robust nuclear power plant structures cannot be reasonably guaranteed to provide adequate protection against aircraft attack.

- In March 2003, *Nuclear Science and Engineering* accepted a peer-reviewed paper authored by staff of the Oak Ridge National Laboratory and the Defense Threat Reduction Agency on the vulnerability of nuclear power plants to sabotage.[11] The authors calculated the peak overpressure produced by an explosion and the ability of nuclear plant structures and components to withstand that force using standard, generally accepted scientific equations. They evaluated two scenarios: (1) an explosion equivalent to that produced by 100 pounds of TNT occurring inside the containment building, and (2) an explosion equivalent to that produced by 3,500 pounds of TNT occurring outside of the turbine building. In both scenarios, the location of the explosion (i.e., where within the containment building or where outside the turbine building) determined the subset of equipment destroyed by the blast. In both scenarios, core damage was a credible outcome.

  The 1982 study by the Argonne National Laboratory cited above reported that 500 pounds of jet fuel could produce the explosive force from 1,000 pounds of TNT.

  THIS study performed by non-NRC government researchers after 9/11 strongly suggests that nuclear power plants are vulnerable to attack.

- In spring 2005, the National Academy of Science (NAS) released a report from its study conducted at the request of the US Congress of the potential security risk posed by storage of spent fuel at nuclear plant sites.[12] The NAS concluded:

  - *The committee judges that successful terrorist attacks on spent fuel pools, though difficult, are possible.* (page 2)

  - *If an attack leads to a propagating zirconium cladding fire, it could result in the release of large amounts of radioactive material.* (page 2)

  - *The analyses carried out for the Nuclear Regulatory Commission (described in the committee's classified report) do not consider maximum-credible scenarios. Instead, the analyses employ reference scenarios that are based either on the characteristics of previous terrorist attacks or on qualitative judgments of the technical means and methods that might be employed in attacks against spent fuel*

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[11] Douglas E. Peplow, C. David Sulfredge, Robert L. Sanders, and Robert H. Morris, Oak Ridge National Laboratory, and Todd A. Hamm, Defense Threat Reduction Agency, "Calculating Nuclear Power Plant Vulnerability Using Integrated Geometry and Event/Fault-Tree Models," *Nuclear Science and Engineering*, 146, 71-87, 2004.

[12] National Research Council of the National Academies, "Safety and Security of Commercial Nuclear Fuel Storage," 2005.

> *storage facilities. Although such reference scenarios are useful for gaining insights on potential consequences of terrorist attacks, they are not necessarily bounding.* (page 28)

THIS study performed by non-NRC researchers after 9/11 shows that nuclear power plants are vulnerable to attack. More importantly, it provides insights into how the NRC dismissed the threat through reliance on secret, non-bounding analyses.

All these studies, and many more like them, strongly suggest that nuclear power plants are vulnerable to aircraft attack. Maybe the NRC Chairman does have secret paper studies prepared behind closed doors with industry representatives that reverse several decades of public studies to show that once vulnerable facilities have been magically transformed into invulnerable fortresses. Or maybe the NRC Chairman has secret studies showing that the facilities are robust and provide adequate protection against attacks by paper airplanes.

② *"The NRC has also taken actions that require nuclear power plant operators to be able to manage large fires or explosions – no matter what caused them."* You don't say. What actions might those be? Certainly not any of these recent actions:

- In April 2006, the NRC published in the *Federal Register* its cockamamie scheme to allow nuclear plant owners to continue operating their reactors with known and emerging violations of fire protection regulations now and well into the future with complete immunity from sanctions.[13] The NRC's scheme included:

    - *In the year 2000, the NRC implemented the Reactor Oversight Process which included systematic inspections of licensees' safe shutdown capability. During these inspections, fire protection inspectors noticed that many licensees had not upgraded or replaced Thermo-lag 330-1 fire barrier material or had not provided the required separation distance between redundant safe shutdown trains, in order to satisfy the requirements in paragraph III.G.2 of Appendix R to 10 CFR Part 50.* (pages 1-2)

    - *In 1998 the NRC issued Confirmatory Order to some licensees to ensure that adequate progress was made towards implementing corrective actions for Thermo*-lag 330-*1 fire barriers. … To date, none of the Orders issued for Thermo-lag fire barriers have been relaxed or rescinded.* (page 2)

    - *Licensees may adopt the performance-based option in 10 CFR 50.48(c). … The NRC will exercise enforcement discretion for existing noncompliance that could reasonably be corrected under 10 CFR 50.48(c). For those noncompliances identified during the licensee's transition process, this enforcement discretion policy will be in effect for up to 3 years. … In addition to the 3-year discretion period, the staff may grant additional extensions to the discretion policy time for a specific plant item(s) with adequate justification.* (page 4)

[13] Nuclear Regulatory Commission, Regulatory Issue Summary 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," June 30, 2006.

In other words, NRC inspections have revealed many nuclear plants in violation of longstanding fire protection regulations. The NRC Ordered plant owners to resolve these violations years ago, but little progress has been made. The NRC gave the lagging owners more time and waived any thoughts about sanctions for their scoffing at safety regulations.

SO, the NRC is allowing "nuclear power plant operators to be able to manage large fires or explosions" by granting them indefinite "get out of jail free cards" for known violations of fire protection regulations.

- In June 2006, the NRC approved exemptions that allow the FitzPatrick and Turkey Point nuclear plants in New York and Florida respectively to permanently fall short of fire protection regulations.[14] In granting the exemptions, the NRC stated:

    - *In 2005, the NRC identified Hemyc fire barriers as potentially nonconforming fire barriers relied on for compliance with fire protection regulations for 1-hour and 3-hour rated protection at some licensed nuclear power plants.* (page 3 of the enclosure)

    - *ENO [Entergy Nuclear Operations, Inc.*] *identified the use of Hemyc in the West Cable Tunnel [at FitzPatrick] and seeks an exemption … on the basis that the existing Hemyc fire barrier in this area is expected to provided at least 30 minute of protection for the redundant safe shutdown trains located there and in combination with existing fire protection features and the absence of significant combustibles and ignition sources in the area.*" (page 4 of the enclosure)

    - *Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix R,Subsection III.G.3 addresses fire protection features for assuring alternative or dedicated shutdown capability in event of a fire, and requires that fire detection and a fixed fire suppression system be installed in the area, room, or zone where equipment or components are relied on for the assured shutdown capability. FPL requests exemption from the requirements of Subsection III.G.3 of 10 CFR 50, Appendix R, for fixed suppression in the Mechanical Equipment Room and for detection and fixed suppression on the Control Room Roof, at Turkey Point, Units 3 and 4, on the basis that the existing fire barriers at Turkey Point, together with fire protection measures, low combustible loading, and administrative controls in place, satisfy the underlying intent.* (pages 1-2 of the enclosure)

SO, the NRC is allowing "nuclear power plant owners to be able to manage large fires or explosions" that might introduce large amounts of very combustible jet fuel by granting them permanent exemptions to fire regulations based in large part on small amounts of combustible materials being present.

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[14] Letter dated June 27, 2006, from John P. Boska, Senior Project Manager, Nuclear Regulatory Commission, to Michael R. Kansler, President, Entergy Nuclear Operations Inc, "James A. FitzPatrick Nuclear Power Plant – Exemption from the Requirements of 10 CFR Part 50, Appendix R," and letter dated June 27, 2006, from Brendan T. Moroney, Project Manager, Nuclear Regulatory Commission, to J. A. Stall, Senior Vice President – Nuclear and Chief Nuclear Officer, Florida Power and Light Company, "Turkey Point Nuclear Plant, Units 3 and 4 – Exemption from the Requirements of 10 CFR Part 50, Appendix R, Subsection III.G.3."

- In October 2004, the NRC approved an exemption that allows the Monticello nuclear plant in Minnesota to permanently fall short of fire protection regulations.[15] In granting the exemption, the NRC stated:

    - *Appendix R, Section III.G.2.b, specifies that (1) cables and equipment and associated non-safety circuits of redundant trains be separated by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards, and (2) fire detectors and an automatic fire suppression system be installed in the fire area.* (page 1 of the enclosure)

    - *NMC [Nuclear Management Company] … requested a permanent exemption from the Appendix R, Section III.G.2.b requirements for separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards for Fire Area IX / Fire Zone 23A, the intake structure pump room. NMC had previously installed two additional emergency service water (ESW) pumps in this area, reducing the distance between Division II ESW pump P111D and intervening cable tray YT4 (containing combustibles) from approximately 20 feet to about 15 feet*. (page 2 of the enclosure)

    - *NMC's letter said that lubricating oil accounts for about 57 percent of the total combustible load in the room. NMC specified the approximate lubricating oil volumes for motors located in the fire zone are as follows:*
        - *3 service water pump motors – 9 quarts each*
        - *electric fire pump motor – 5 quarts*
        - *screen wash / fire pump motor – 5 quarts*
        - *2 make-up pump motors – 7 quarts each*
        - *4 residual heat removal (RHR) service water (SW) pump motors – 13 gallons each*
        - *2 circulating water pump motors – 38 gallons each* (page 3 of the enclosure)

SO, the NRC is again allowing "nuclear power plant owners to be able to manage large fires or explosions" that might introduce large amounts of very combustible jet fuel by granting them permanent exemptions to fire regulations based in large part on small amounts of combustible materials being present.

The fire protection regulations (even if met and non-exempted) are intended to deal with a single fire in a single room or area. No other equipment damage is presumed to occur, other than the components within that room or area damaged by the single fire itself. Will those fire protection regulations (again, even if met and non-exempted) prove adequate to deal with fires in multiple rooms and areas that can easily result from an aircraft crash? Will, for example, the installed fire sprinklers be able to discharge sufficient water to all the affected areas, despite rupture of one or more fire headers caused by the aircraft impact?

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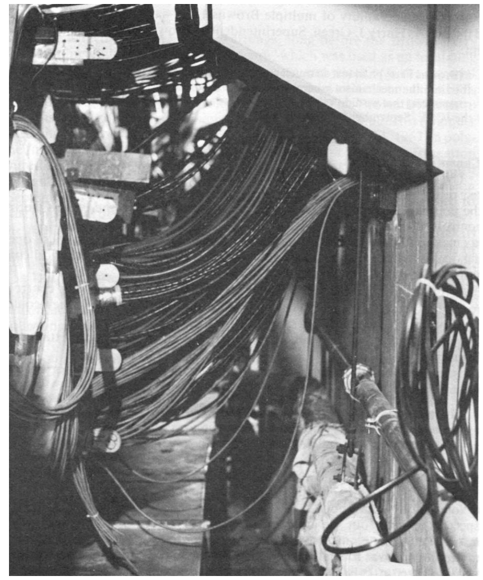
[15] Letter dated October 28, 2004, from L. Mark Padovan, Project Manager, Nuclear Regulatory Commission, to Thomas J. Palmisano, Site Vice President, Nuclear Management Company LLC, "Monticello Nuclear Generating Plant – Exemption from the Requirements of 10 CFR Part 50, Appendix R, Section III.G.2.B Applying to Fire Area IX / Fire Zone 23A – Intake Structure Pump Room."

GET REAL!

In March 1975, a worker held a lit candle into the place where electrical cables passed through a wall penetration from the cable spreading room beneath the main control room into the reactor building at the Browns Ferry nuclear plant in Alabama. He was testing for air leaks. If the candle flame flickered, it indicated that the packing material around the cables wasn't sufficient to block air flow between the buildings. This time, the candle flame ignited the packing material. The fire burned for nearly seven hours. As insulation burned off cabling, wires came into contact with each other and shorted out. All of the emergency systems for cooling the Unit 1 reactor core were disabled as were most of those systems for Unit 2. Heroic operator actions narrowly prevented both reactor cores from meltdown.



Does anyone – other than the NRC – really believe that a terrorist at the controls of a large, fast aircraft fully laden with jet fuel who crashes into a nuclear power plant will do no more harm than one guy with one candle inflicted at Browns Ferry?

The revised security regulations approved by the Commissioners upgraded defense against ground-based attacks by a small band of intruders. The old regulation was reported to limit the small band to three persons or less and the revised regulation has been reported as being less than double the old number.[16] In simulated force-on-force tests, sometimes the small group of mock attackers succeeds in damaging enough equipment to trigger reactor core meltdown. Does anyone – other than the NRC – really believe that a terrorist crashing a large aircraft into a facility will do less harm than a handful of guys running about on foot?

The NRC has better things to do than make veracity-deprived statements. Like enforce fire protection regulations, for a starter.

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[16] Mark Thompson, *TIME Magazine*, "Are These Towers Safe?" June 12, 2005.