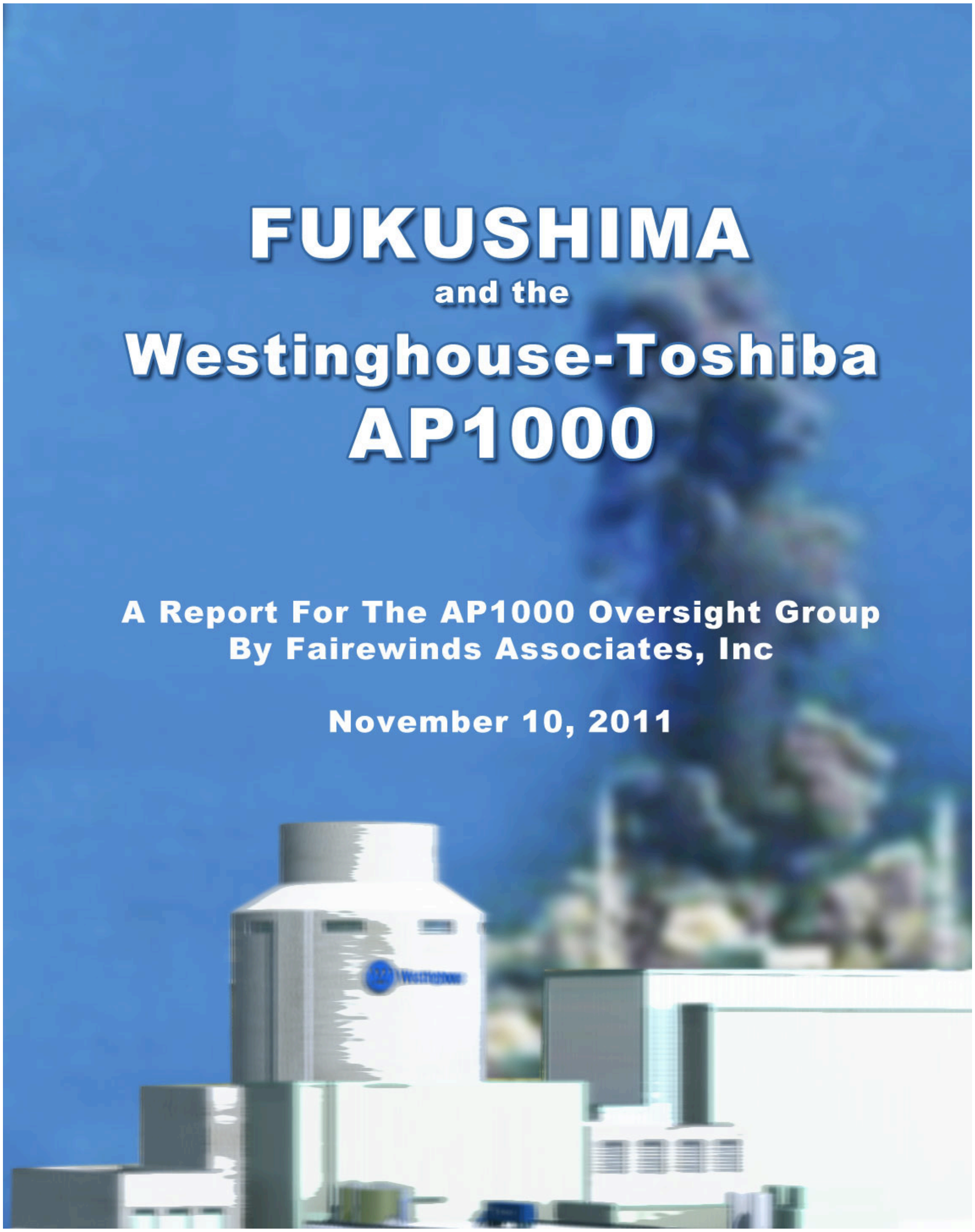

FUKUSHIMA
and the
Westinghouse-Toshiba AP1000

A Report For The AP1000 Oversight Group
By Fairewinds Associates, Inc

November 10, 2011

Introduction

The AP1000 Oversight Group has previously identified serious concerns regarding the inability of the AP1000 Shield Building to act as an effective Ultimate Heat Sink (Sterrett) and its Containment System to prevent releases of radioactivity in the event of an accident (Fairewinds). Following a thorough review of the AP1000 design in the aftermath of the Fukushima accidents, The AP1000 Oversight Group issues this report to alert the NRC to six additional areas of consternation regarding both the safety and reliability of the AP1000.

The AP1000 Oversight Group is not alone in expressing significant apprehension about the Fukushima accidents and their impact upon the design and operation of US nuclear power plants. The NRC also commissioned the Fukushima Near Term Task Force to assess post-Fukushima nuclear power plant design and operations. As a follow up to the Fukushima Near Term Task Force Report, the senior management of the NRC issued SECY-11-0137 on October 3, 2011 in which the NRC management recommended specific actions in order to address plant modifications required by the Fukushima accidents.

The AP1000 Oversight Group's six areas of major concern and unreviewed safety questions requiring immediate technical review by the NRC are:

- Additional Heat Load on the Containment
- The Loss of the Ultimate Heat Sink (LoUHS) and the Containment/Shield Building Interface,
- Loss of the Ultimate Heat Sink and cooling the Spent Fuel Pool (SFP),
- Containment Integrity,
- Multiunit Site Accident Interactions, and the
- Design Basis Events.

Fairewinds conclusion is that certification of the AP1000 should be delayed until the original and current "unanswered safety questions" raised by the AP1000 Oversight Group are resolved.

Concern 1 Additional Heat Load on the Containment

The AP1000 Containment is extraordinarily close to exceeding its peak post accident design pressure. As part of its 19th Revision to its AP1000 Design Certification and license application Westinghouse-Toshiba removed conservative assumptions and included potential heat absorbers in its design calculations of peak Containment pressure. This Westinghouse-Toshiba reanalysis allowed the AP1000 design to barely meet required Design Certification pressure limits. According to an Advisory Committee on Reactor Safeguards (ACRS) letter dated September 19, 2011,

> …the containment peak pressure of 58.3 psig is close to the containment design pressure of 59 psig….

Given that three out of three Containment Systems have failed at Fukushima, such a pressure burden to the Containment System is too great a risk to public health and safety. As additional problems are identified in this rush to market the AP1000 design, the regulatory limited peak design pressure will be exceeded.

Despite the fact that there is literally no margin left in the peak Design Certification pressure calculations, the NRC has not considered any of the problems identified by the Fukushima accident when evaluating the proposed Westinghouse-Toshiba AP1000 design. Specifically, there have been numerous indications of inadvertent nuclear criticalities after TEPCO claimed that its four damaged Fukushima reactors were completely shutdown almost eight months ago. In contrast, scientists around the world have identified many telltale indicators from Fukushima that can only be attributable to nuclear fission, including production of unique fission-generated radioactive gasses. Most recently, TEPCO finally admitted in the New York Times that an inadvertent criticality had most likely been occurring for months.

> **Fears of Fission Rise at Stricken Nuclear Plant in Japan**
> By HIROKO TABUCHI
> TOKYO — Nuclear workers at the crippled Fukushima power plant raced to inject boric acid into the plant's No. 2 reactor early Wednesday after telltale radioactive elements were detected there, and the plant's owner admitted for the first time that fuel deep inside three stricken plants was probably continuing to experience bursts of fission. *New York Times*, November 2, 2011.

http://www.nytimes.com/2011/11/03/world/asia/bursts-of-fission-detected-at-fukushima-reactor-in-japan.html

The current, marginal post accident peak Containment pressure analysis that Westinghouse-Toshiba assumes on its design for the AP1000 assumes that once a nuclear reactor is shutdown after an accident has begun, the reactor stays shutdown. Even though the Fukushima accidents have clearly proven the fallacy of this Westinghouse-Toshiba calculation, Westinghouse-Toshiba does not include any additional heat from a continuing nuclear fission reaction like the Fukushima atomic power plants are currently experiencing. The scientific evidence unequivocally shows that residual heat from fission product decay is the source of the significant pressure inside the containment.

If the NRC were to direct Westinghouse-Toshiba to include even a small post accident recriticality of less than 1 percent of the original reactor output, the AP1000 Containment pressure could increase to levels above what it is designed to withstand and above licensable limits required by the NRC. The AP1000 Oversight Group believes it is imperative that all the lessons of Fukushima (including Containment heat loads from recriticality) be incorporated into the AP1000 design before the Design Certification is issued.

Concern 2 Loss of the Ultimate Heat Sink (LoUHS) and the Containment/Shield Building Interface

Dr. Susan Sterrett, a former Westinghouse-Toshiba engineer, has repeatedly notified and testified to the NRC alerting the NRC to the inadequacy of AP1000 Ultimate Heat Sink (UHS). Dr. Sterrett's concerns center on the inability of the Shield Building and Containment to adequately transfer heat that has built up inside the containment, through the steel containment, into the annular gap created by the Shield Building and out into the environment. The multi-plant accidents at Fukushima identify that the Loss of the Ultimate Heat Sink can cause a meltdown and/or a hydrogen explosion.

The photograph below shows that all (8) of the emergency service water pumps at Fukushima were destroyed following the tsunami. This inability to cool the reactors by emergency means is called a Loss of the Ultimate Heat Sink (LoUHS).

Photo from Fukushima Nuclear Power Plant Accidents – Note Loss of Ultimate Heat Sink (LoUHS)

In SECY-11-0137 the Fukushima Near Term Task Force acknowledged that one of the root causes of the four Fukushima nuclear accidents was LoUHS.

> PURPOSE: The purpose of this paper is to provide, for Commission consideration, the staff's proposed prioritization of the Fukushima Near-Term Task Force (NTTF) recommendations to (1) reflect regulatory actions to be taken by the staff in response to the Fukushima lessons learned… At this time the staff has identified a number of additional issues with a clear nexus to the Fukushima Daiichi event that may warrant regulatory action…. The additional recommendations warranting further consideration and potential prioritization are… the Loss of ultimate heat sink. SECY-11-0137, Page 5 (Emphasis added)

The significant and irreconcilable flaw in the AP1000 design is the fact that the Westinghouse-Toshiba Severe Accident Mitigation Design Alternative (SAMDA) analysis assumes that there is zero probability of a LoUHS. This error in the SAMDA code is an unresolved safety question pointed out by both the Fukushima Near Term Task Force and the AP1000 Oversight Group. The four nuclear power plant accidents at Fukushima confirmed that a Loss of the Ultimate Heat Sink accident has an astronomically high probability of occurring, as in four out of four accidents, or 100%, and not the zero probability assumption currently predicted by Westinghouse-Toshiba.

The AP1000 Oversight Group does not have the wherewithal to identify *every possible accident precursor* that could cause the AP1000 to experience a LoUHS accident. And, while there may be other failure modes significantly impacting the ability of the Westinghouse-Toshiba passive design to cool itself, the Oversight Group has identified at least seven failure modes that the NRC and Westinghouse-Toshiba have not considered. These seven "unreviewed safety questions" regarding LoUHS and the Containment/Shield Building interface must be analyzed prior to Design Certification of the AP1000.

The first unreviewed safety question is that of an aircraft strike directly hitting the AP1000 Passive Cooling System water tank that sits high atop the Shield Building and is a direct line of sight target. During its review of the AP1000, the Oversight Group discovered that the NRC analysis of an airstrike into the Shield Building does not bound the worst case of Loss of the Ultimate Heat Sink accident if the Passive Cooling System water tank itself is the target of the airstrike.

2.1 What if terrorists attack using munitions that they direct at the AP1000 Passive Cooling System water tank that is a direct line of sight target because it sits high atop the Shield Building? This scenario also has not been considered.

2.2 From the AP1000 review, it appears that the AP1000 could be unable to refill its Passive Cooling System water tank if the equipment onsite is severely damaged and access to the site is impaired. Such scenarios could exist during a damaging hurricane, tornado, flood, earthquake, terrorist attack or a multiunit accident.

The photo below indicates the quantity of debris generated when a single reactor on a multiunit site explodes. Debris generated in this event directly applies to issues 2.4 through 2.6.

2.3 Many of the AP1000 nuclear power plants are being considered for multiunit power plant sites. What could happen to the extremely vulnerable AP1000 Passive Cooling System water tank if adjacent nuclear power plants at a multiunit site had explosions? Flying debris is plainly visible in the videos of the Fukushima #1 explosion, and that flying debris damaged adjacent nuclear power plants. When Fukushima #3 exploded only several days later, debris once again flew everywhere.

2.4 The AP1000 cooling design is dependent upon airflow into the annular gap surrounding the containment. Clogging of the vents on the AP1000 Shield Building due to debris from the explosion of adjacent nuclear units at a multiunit site, like the proposed Vogtle and VC Summer sites, could impede airflow into the annular gap surrounding the AP1000 Containment if an adjacent unit exploded. Large quantities of rubble and flying debris are plainly visible in the photographs first taken when Fukushima #1 exploded and again when Fukushima #3 exploded several days later. Such dust and rubble could easily hamper the effectiveness of the AP1000 cooling design and cause inadequate heat transfer on the outside surface of the AP1000 Containment Building due to debris from the explosion of adjacent nuclear units at a multiunit site. Both the Plant Vogtle and VC Summer proposed AP1000 units are on multi-unit sites and therefore will be extremely vulnerable to an accident from the blocked vents on the AP1000 Shield Building. Therefore, it is imperative that the Design Certification be held up until this issue is reviewed and adequate changes are made to the multi-unit sites prior to Design Certification, issuance of a COL, and major site construction efforts that could compromise safety of the AP1000.

2.4.1 Plugging of the AP1000 air vents required to cool nuclear fuel should be included in the SAMDA calculation; however, the NRC ranks it as a zero probability of occurrence. Indeed, the NRC has already been informed that such blockage of air-cooled nuclear fuel has happened at the Fort St. Vrain Interim Spent Fuel Storage Installation according to its recent Event Notification:

> At 1009 (all times MDT) today, 11/3/11, a Security Officer performing routine rounds noted 95-100% blockage on the inlet screens at the Fort St. Vrain Independent Spent Fuel Storage Installation (FSV ISFSI)... The inlet screens are in place to provide a cooling path for the used fuel... The blockage was caused by frost, which had built up due to dense fog, high humidity, and low temperatures.... *NRC Event Notification 47406*, November 3, 2011.

2.4.2 Given that plugging of the airflow to a nuclear fuel cooling device has already occurred and that a Fukushima-like explosion could produce even more material that could plug the AP1000 vents, it is an absolute falsehood to assume a zero probability risk factor to the plugging of the AP1000 vents.

2.5 A clean smooth heat transfer surface is required for the AP1000 Containment to transfer heat to the air into the annular gap. As seen in the Fukushima explosion photo above, large amounts of dirt, dust, and debris are generated when there is a nuclear power plant explosion. On a multiunit site, such dirt and dust could hinder the ability of the AP1000 Containment to transfer heat into the air of the annular gap.

2.6 Lastly, from our preliminary review, The AP1000 Oversight Group also uncovered the possibility of failure of the squib valves to operate due to explosive debris from a terrorist attack, an airplane accident, or the explosion of other nuclear power plants on a multiunit site. These squib valves have been specially designed for the AP1000 to release water from the Passive Cooling System water tank in the event of an accident. The NRC has already expressed concerns over the ability of the valve to function properly and has ordered squib

> valve testing[1]. Unfortunately, the AP1000 squib valves have only been tested in a laboratory environment completely free of dust and debris. The “unreviewed safety question” is will the squib valve on the AP1000 be operable in the clouds of dust and debris created by any type of explosion – an airplane crash, a terrorist attack, or an accident at an adjacent nuclear power plant? This type of rubble, debris, and dust is plainly visible in photographs of the explosions at Fukushima Units 1 and 3.

The existing SAMDA as applied by Westinghouse-Toshiba in its assessment of the integrity of the AP1000 design assumes there is *zero percent probability* that there ever could be a LoUHS accident at an AP1000 plant. The AP1000 Oversight Group has already identified that this erroneous SAMDA assumption had no factual basis and that even prior to the Fukushima accidents, use of *zero percent probability* was highly improbable and a manipulation of the SAMDA code. Now, with the AP1000 Passive Cooling System water tank sitting high in the Shield Building as a vulnerable target, the new evidence from the Fukushima accidents proves that the insertion of a zero percent probability assumption into the SAMDA code is a blatant manipulation of a safety code designed to protect public health and safety. Prior to final approval of the Design Certification for the AP1000 Combined Operating License (COL), the NRC must analyze the “unanswered safety question” of an event that happened four times in one day at the Fukushima nuclear power plant site. The NRC Staff has already concluded in SECY-91-0041 that these newly identified post-Fukushima severe accident issues relate to AP1000 design and that any SAMDA changes “should be addressed as part of the Design Certification process". Therefore, until the NRC evaluates valid SAMDA assumptions, the Design Certification process must remain open.

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[1] Letter from the Advisory Committee on Reactor Safeguards to the Commission, January 24, 2011.

Concern 3 Loss **of the Ultimate Heat Sink and cooling the Spent Fuel Pool (SFP)**

The Spent Fuel Pool cooling on the AP1000 is quite conventional and applies the Spent Fuel Pool cooling features used in the current generation of nuclear power plants. The accidents at Fukushima, especially the overheating and the hydrogen explosions in the Unit 4 Spent Fuel Pool caused by LoUHS, have proven that the calculations and assumptions about the AP1000 SFP design are wholly inadequate. The outdated design features cribbed from the current generation of nuclear power plants are subject to the same failure modes as evidenced at Fukushima. SECY-11-0137 clearly indicates that new (Part 52) reactors must have their spent fuel pool cooling systems modified as a result of the four accidents at Fukushima.

> The staff concludes that the regulatory solution for SBO [Station Blackout] mitigation is implementation of new requirements intended to strengthen SBO mitigation capability at all operating **and new reactors** to address prolonged SBO stemming from design-basis and beyond-design-basis external events to provide core and **spent fuel pool cooling**, reactor coolant system integrity, and containment integrity. This regulatory action would consider the need for SBO power source(s) and mitigating equipment to be diverse and protected from external events. This regulatory action would also examine whether there is a need to expand SBO mitigation requirements to require power reactors to mitigate an SBO event at a plant (each unit for multiunit site) until either the onsite or offsite power source is restored to bring the power reactor to a cold shutdown and to maintain **spent fuel pool cooling**. This rulemaking would primarily amend 10 CFR 50.63 and would impact both operating reactor licensees and **new reactor applications.** Page 20 of SECY-11-0137 (Emphasis added).

Given that the Fukushima Near Term Task Force's recommendations as written in SECY-11-0137 have already *mandated that new reactors have their Spent Fuel Pool (SFP) cooling* examined, adding in the requisite reevaluation of the LoUHS to the SFP could enable the "unreviewed safety question" assessment necessary for Design Certification of the Westinghouse-Toshiba AP1000.

Furthermore, all of the Fukushima Near Term Task Force's recommendations on Spent Fuel Pool cooling systems are directly applicable to the AP1000 design. For example, Station Blackout (SBO) will also impact the AP1000, so that the service water systems used to cool the Spent Fuel Pool are likely to fail causing a LoUHS accident. The emergency service water pumps were destroyed at Fukushima, and since the AP1000 relies upon a similar cooling system for its spent fuel pools, a new analysis of these Fukushima issues must be conducted in order to answer these "unreviewed safety questions".

Moreover, since the Westinghouse-Toshiba SAMDA analysis assumes that there is *zero probability of a Loss of the Ultimate Heat Sink accident in the Spent Fuel Pool*, it is back to the design boards for these "unreviewed" and unanalyzed "safety questions". Furthermore, Fukushima Unit 4 pointed out that local boiling within each spent fuel bundle could occur even if the bulk pool temperature is only 75C. Thus, the local spent fuel bundle boiling will cause excessive hydrogen generation and excessive humidity even if bulk pool temperature is below 100C. None of these dangerous possibilities have been addressed in current nuclear power plant spent fuel storage design or in the design of the AP1000, which has its fuel storage both inside and outside of the Containment System.

Concern 4 Multiunit Site Accident Interactions of Design Basis Events at Shared Nuclear Power Plant Sites like Vogtle, V.C. Summer, and Turkey Point

The Fukushima accidents have clearly demonstrated that accidents occurring at older nuclear power plants sharing a multiunit site will impact the safety of newer nuclear power plants built nearby. Additionally, on multiunit AP1000 sites, a failure of one AP1000 could also adversely impact any other AP1000 units. The NRC identifies this as a specific concern:

> The staff recommends that the NRC, as a near-term action, undertake regulatory activities to:
>
> > 1. Interact with stakeholders to do the following: (1) inform development of acceptance criteria for reasonable protection of 10 CFR 50.54(hh)(2) equipment from design-basis external hazards, (2) assess the need to supplement equipment to support **multiunit event mitigation**, ….

> 2. Order licensees to do the following: (1) provide reasonable protection of the equipment used to satisfy the requirements of 10 CFR 50.54(hh)(2) from the effects of external events, (2) establish and maintain sufficient capacity to **mitigate multiunit events....** SECY-11-0137, Page 24 (Emphasis added)

The AP1000 Oversight Group's concerns regarding the reevaluation of problems at multiunit sites encompasses and expands upon those of SECY-11-0137. Given that the Fukushima Near Term Task Force's recommendations as written in SECY-11-0137 has already mandated that new reactors have their multiunit events examined, the concerns raised by The AP1000 Oversight Group could be addressed as part of the mandatory reevaluation.

More specifically, The AP1000 Oversight Group notes that a review of the data from the Fukushima accidents establishes the facts that:

- The explosion of Fukushima Unit 1 adversely impacted the accident recovery efforts for Units 2, 3 and 4.
- The explosion of Fukushima Unit 3 adversely effected recovery at Units 1, 2 and 4 and may have been a causative factor in the Unit 4 explosion.
- The Fukushima Unit 4 explosion adversely effected recovery at Units 1, 2 and 3.

When the AP1000 shares a site with older nuclear power plants or another AP1000, the following accident sequences are possible and these unreviewed safety questions have not here-to-for been considered by the NRC.

4.1 An explosion at another power plant on a multiunit site could damage the Passive Cooling System water tank of the AP1000, which sits high atop the Shield Building and is a line of sight target.

4.2 An explosion at another power plant on a multiunit site could damage the Shield Building of the AP1000. Flying rubble and explosive detonation forces could damage the Shield Building.

4.3 Explosive debris from an explosion at another power plant on a multiunit site could ruin the ability of the squib valve to open and allow the Passive Cooling System water tank to drain onto the Containment of the AP1000.

4.4 Explosive debris from an explosion at another power plant on a multiunit site could plug the holes in the AP1000 Shield Building thereby eliminating heat transfer.

4.5 Explosive debris from an explosion at another power plant on a multiunit site could limit heat transfer from the Containment System of the AP1000.

Concern 5 Containment Integrity

More than 18 months ago, Fairewinds Associates' chief engineer Arnie Gundersen and The AP1000 Oversight Group notified the NRC regarding the inadequacy of the AP1000's ability to maintain Containment Integrity. The AP1000 Oversight Group met with the Advisory Committee on Reactor Safeguards (ACRS) June 25, 2010 specifically to alert the NRC ACRS that the Westinghouse-Toshiba SAMDA analysis assumes that there is zero probability of Containment breach. The NRC staff met with the ACRS in October of 2010 and told the ACRS again that there is an assumption of a zero probability of a Containment failure. This staff assumption was inappropriate before Fukushima and certainly can no longer be supported in light of the three Fukushima Containment failures.

Events at Fukushima have shown that three Containment Systems have failed completely, thereby leaking radioactivity into the environment exactly as suggested by Mr. Gundersen in the original Fairewinds Associates' report first issued 18-months ago. Unfortunately, the accidents at Fukushima have proven that there is a finite, indeed high, probability of Containment System failure resulting in significant releases of radioactivity directly into the environment. Moreover, the AP1000 design could further exacerbate Containment System failure and leakage of significant amounts of radioactivity due to the AP1000 "chimney effect" that is designed to remove heat during an accident, as described in the AP1000 Containment Leakage Report Fairewinds Associates - Gundersen, Hausler, 4-21-2010.

Furthermore, Fukushima Unit 3 experienced a detonation (not deflagration) shockwave that the AP1000 Containment could not withstand. Recent discussions between the NRC and Westinghouse-Toshiba indicate that there was little or no remaining design margin for the AP1000 Containment design pressure in the Westinghouse-Toshiba accident calculations even prior to the Fukushima accident. Explosions due to hydrogen generation occurred in the Three Mile Island Containment and at three of the Fukushima containments/reactor buildings and therefore must be considered for the AP1000 Design Certification.

Recommendations by the Fukushima Near Term Task Force, as written in SECY-11-0137, clearly indicate that new (Part 52) reactors must have their Containment Integrity reevaluated as a result of the four accidents at Fukushima.

> Initiate rulemaking to revise 10 CFR 50.63 to require each operating and new reactor licensee to: …… establish the equipment, procedures, and training necessary to implement an "extended loss of all ac" coping time of 72 hours for core and spent fuel pool cooling and for reactor coolant system **and primary containment integrity** as needed, and (3) preplan and prestage [pre-stage] offsite resources to support uninterrupted core and spent fuel pool cooling, and reactor coolant system and **containment integrity** as needed, including the ability to deliver the equipment to the site in the time period allowed for extended coping, under conditions involving significant degradation of offsite transportation infrastructure associated with significant natural disasters….The staff concludes that the regulatory solution for SBO [Station Blackout] mitigation is **implementation of new requirements** intended to strengthen SBO mitigation capability at all operating and **new reactors** to address prolonged SBO stemming from design-basis and beyond-design-basis external events to provide core and spent fuel pool cooling, reactor coolant system integrity, **and containment integrity….** This rulemaking would primarily amend 10 CFR 50.63 and would impact both operating reactor licensees and **new reactor applications**. SECY-11-0137, Page 20 (Emphasis Added)

The concerns of The AP1000 Oversight Group regarding the reevaluation of Containment Integrity encompasses and expands upon those of the Fukushima Near Term Task Force's recommendations as written in SECY-11-0137. Given that the Fukushima Near Term Task Force has already mandated that new reactors have their

Containment Integrity examined, these “unanswered safety questions” and concerns presented by The AP1000 Oversight Group could reasonably be included in the mandated reevaluation.

Concern 6 Design Basis Events

The earthquake and tsunami were natural catastrophes in Japan and on the Fukushima coastline that were “design basis events”. Likewise in 2011, the Ft. Calhoun flood and the North Anna earthquake also approached “design basis events”. According to industry definition, a design basis event should occur infrequently, in general less than once in one thousand years. Instead, four such natural catastrophe design basis events (the Japan earthquake and tsunami, the Ft. Calhoun flood, and the North Anna earthquake) have occurred during the past six months indicating that the NRC and the nuclear industry have grossly underestimated the magnitude of any design basis event. The AP1000 design and these unreviewed safety questions must be reevaluated in light of this new information to assure that the AP1000 is capable of withstanding more frequent and more intense natural catastrophe-caused design basis events.

The Fukushima Near Term Task Force clearly indicates in SECY-11-0137 that new (Part 52) reactors must have their design basis and beyond design basis events reevaluated as a result of the four accidents at Fukushima.

> The staff concludes that the regulatory solution for SBO mitigation is implementation of new requirements intended to strengthen SBO mitigation capability at all operating and **new reactors** to address prolonged SBO **stemming from design-basis and beyond-design-basis external events** to provide core and spent fuel pool cooling, reactor coolant system integrity, and containment integrity. SECY-11-0137, Page 20 (Emphasis added)

Conclusion

The AP1000 Oversight Group believes that by allowing new Part 52 reactors to be licensed and constructed before the lessons of the four Fukushima accidents are fully incorporated into these new power plant designs, the NRC does not meet its charter to protect public health and safety. While the purpose of Design Certification and the COL license process was to have only one license hearing. Requiring that the Fukushima modifications occur after Design Certification will distort the intent of the entire COL process and also distort the construction process. It is likely that the above recommendations made by The AP1000 Oversight Group as well as other problems identified by the NRC will require extensive redesign and modifications to the AP1000 design. Complex changes of this magnitude are better resolved prior to construction of safety related structures in order to assure adherence to the most up-to-date safety criteria and to lessen the financial burden on consumers. Otherwise, the likely changes that will be required to the design once construction has begun will strain safety and financial parameters and do not meet the intent of the Design Certification process.

The NRC appears to agree with The AP1000 Oversight Group's position that the Design Certification's for new reactors must be delayed.

> **For new reactor designs currently under review, safety issues should be resolved at the design stage, to the extent practical. Consistent with the Commission policy encouraging standardization, it would be prudent to implement safety enhancements prior to certification or design certification renewal.** As such, the staff intends to begin interactions with new reactor stakeholders in the near term to allow sufficient opportunity for design certification applicants and design certification renewal applicants to address recommended design-related safety enhancements prior to completion of the staff's review. It should be noted that imposition of new requirements as part of a design certification renewal is governed by 10 CFR 52.59. **The staff will encourage reactor vendors to provide enhanced safety features and safety margins consistent with the Commission policy on advanced reactors.** SECY-11-0137, Page 6.

Nationwide, and especially in the Southeastern United States, there is no shortage of power and no urgency to construct the new AP1000 nuclear power plants. The prudent approach would be to incorporate the valuable lessons learned from the Fukushima accidents into the design of the AP1000 before the NRC proceeds with the Design Certification process and issues a faulty Combined Operating License.

Political and lobbyist pressure from reactor vendors and the nuclear industry appear to be the key factors motivating the NRC to put the public's health and safety at risk by forcing an early completion of the AP1000 Design Certification process.

Arnie Gundersen, Chief Engineer
Fairewinds Associates, Inc
November 10, 2011

-End-