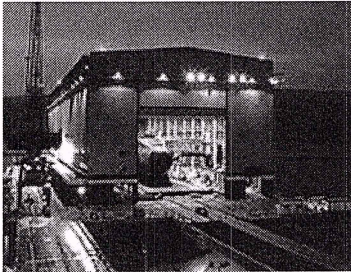


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Faslane shiplift vulnerable to aircraft

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Scottish CND has obtained a copy of a safety review of the Faslane shiplift under the Freedom of Information Act. The 6 page report was published in March 2003 by Atkins Defence Systems for the MoD and has the title "Review of Radiological Accident Probability Assessments and Radiological Probabilistic Assessments for Vanguard Class SSBN whilst on the Shiplift at HMNB Clyde".[1]

The review identified 3 major failings in these safety studies:

1. The studies did not take proper account of the fact that the shiplift would fail if a large aircraft crashed into the facility.
2. The probability of a Trident missile exploding in a fire had been underestimated.
3. The possibility of a Trident missile spontaneously igniting had not been considered.

Aircraft

The maintenance of Trident submarines is carried out in the 185 metre long shiplift at Faslane.[2] This has priority over all other work in the facility. When Trident submarines are taken into the shiplift they are still armed with missiles and nuclear warheads. These can both be offloaded at Coulport but the process is so hazardous that unloading operations are kept to a minimum.

The safety review said that if a large aircraft crashed into the shiplift then the platform and blocks, which hold the submarine, would collapse. The possible consequences were revealed in another paper presented by Atkins Defence Systems at a conference on military safety in October 2003.[3] This paper said that an aircraft crash could result in the failure of the shiplift platform and that this could lead to the detonation of a Trident missile.

Trident submarines normally carry around 14 missiles, although they can take 16. Each missile contains solid fuel which has an explosive power equivalent to 70.3 tonnes of TNT.[4] The rocket fuel in 14 missiles is equivalent to 980 tonnes of TNT.

In 1990 the nuclear expert Sidney Drell chaired an inquiry into the safety of US nuclear weapons for the House Armed Services Committee.[5] The Drell report identified a major problem with the design of Trident. Several nuclear warheads are positioned around the third stage of each missile. The Drell report said that if the third stage of a missile detonated there could be a low-yield nuclear explosion. Each British Trident submarine carries a total of 48 nuclear warheads.

The missile compartment on a Trident submarine is adjacent to the PWR2 nuclear reactor. When in the shiplift the reactor would be shut down but this does not eliminate the risk of a reactor accident. If there was a missile explosion or low-yield nuclear explosion the reactor could be damaged. In many accident scenarios the submarine hull would contain much of the radiation, but in a major explosion it is likely that the hull would be ruptured. As a result a large amount of radioactive material could be released into the atmosphere.[6]

In summary, if a large aircraft crashed into the shiplift the platform holding a Trident submarine would fail. This could lead to a missile explosion. Such an explosion would result in the dispersal of plutonium. It could also trigger a nuclear explosion and/or a release of nuclear material from the reactor.

In June 2007 the MoD told a representative of SEPA that their plans to replace Trident could mean that a new dry dock was built at Faslane.[7] This is probably because of concerns about the safety of working on nuclear-armed submarines in the shiplift. However a new dry dock would be a major development and could be blocked by the Scottish Government.

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Missile explosion in fire

Heat can cause ammunition to explode. This is called cook-off. The probability that a Trident missile might detonate in a fire, missile cook-off, is a critical part of the assessment of the safety of Trident. The Atkins review found that different figures were used in two key reports. It concluded "justification for the probability of missile-cook-off is required". The actual figures were censored in the copy of the report provided to Scottish CND.

Spontaneous ignition

The explosives in a Trident missile can spontaneously catch fire. The Atkins report in March 2003 says that this hazard was ignored in the safety assessments which they reviewed.

The missile contains stabiliser in order to prevent spontaneous ignition. The temperature and humidity in the missile tube should be constantly monitored so that this stabiliser does not degrade. If the correct environment is not maintained the stabiliser can fail and the missile can ignite. Charts used in the Atkins briefing in October 2003 shows that auto-ignition of rocket fuel can result in the detonation of a missile

(Shiplift History)

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- [1] Review of Radiological Accident Assessments and Radiological Probabilistic Assessments for Vanguard Class SSBN whilst on the shiplift at HMNB Clyde, by Atkins for DOSG ST2 (MoD), March 2003. www.banthebomb.org/newbombs/shipliftatkinsreport.pdf
- [2] Illustration of shiplift at: www.banthebomb.org/newbombs/shiplift1.c.gif
- [3] The Use of Bow Tie Analysis in OME Safety Cases, MJ Gifford (Atkins), SM Gilbert (Atkins) & I Barnes (DOSG ST2), 5th MoD Equipment Safety Assurance Symposium, October 2003. Figure 2 from the report is online at www.banthebomb.org/newbombs/bowtie2.gif
- [4] The explosives in a Trident D5 missile weigh 50.1 tonnes. The material has 140% of the explosive power of TNT, giving a Net Explosive Weight (TNT equivalent) of 70.1 tonnes. US Government Bill of Lading GBL G-4432893, 1 September 1988, quoted in Trident D5 Missile Explosive Propellant Hazards, Glen Milner, Ground Zero Campaign, July 2001.
- [5] Report of the Panel on Nuclear Weapon Safety of the House Armed Services Committee, December 1990. Page 29. http://www.plrc.org/docs/Drell_Report_1990.pdf
- [6] The Safety of Trident, An assessment of the radiation risks associated with the UK Trident programme, Scottish CND, 1994. The reactor accident assessment is based on nuclear training manuals from the Royal Naval College, Greenwich. <http://www.banthebomb.org/helpscnd/trisafch4.html>
- [7] Note of an MoD briefing on the Environmental Baseline for the Future Submarine Programme in Glasgow on 25 June 2007, obtained by Scottish CND under the Freedom of Information Act www.banthebomb.org/newbombs/MoDSEPAFaslane.pdf

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Comments

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