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"During Inspection of Fuel Elements---SRE---
Parted Fuel Element..."

FOR RELEASE-Saturday A. M. August 29, 1959

AI-40

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Wired Copy to Ray Schacht and Em Jones

Approved by K. Dunbar, COA; Telecon & AVO to Van Dyke; TWX of Entire Release to Van Dyke, 8-28; Telecon, Ladd to Ryan, 8-27. Telecon, Ladd to Schacht and Jespersen to Frank Grant, 8-29.

NEWS from ATOMICS
A Division of North American Aviation, Inc.
P.O. Box 309, Canoga Park, California
PUBLIC RELATIONS, Diamond 7-0200

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FOR RELEASE - Saturday A. M., August 29, 1959

CANOGA PARK, CALIF. -- During inspection of fuel elements on July 26 at the Sodium Reactor Experiment, operated for the Atomic Energy Commission at Santa Susana, California by Atomics International, a division of North American Aviation, Inc., a parted fuel element was observed.

The fuel element damage is not an indication of unsafe reactor conditions. No release of radioactive materials to the plant or its environs occurred and operating personnel were not exposed to harmful conditions.

The occurrence is of importance from a technical standpoint and a detailed study is underway to determine the precise cause of the damage.

The fuel element of the SRE is a cluster of seven stainless steel tubes, each approximately 3/4 inches in diameter and 6 feet long. Each tube contains a column of six-inch long uranium metal slugs. These tubes are capped at the two ends. The elements are suspended in the core of the reactor by means of hanger rods from plug in the upper shield.

To date, 34 of the 43 elements comprising the fuel loading of the core have be examined by means of the fuel handling cask television system. Six elements have only an upper portion of the element attached to the hanger rod. In each case, all seven tubes of the fuel element cluster were parted and a portion of the lower end of the fuel element remained in the core. This fuel loading, nearing the end of its useful life, was scheduled to be removed in the near future.

(more)

Preliminary indications are that the damage could have been caused by restrictions in the coolant passages resulting from-inadvertent introduction of an organic material into the reactor. This material could have come from leaks in a primary coolant pump where tetralin, an organic compound, is used in freeze seals to eliminate sodium leakage into the pump bearings and drive. Preliminary investigation of the stainless steel fuel cladding of one element indicates the element was damaged through formation of a uranium-iron alloy in the cladding in the area of the failure.

The SRE is the first experiment in the Commission's program to develop a sodium graphite reactor, one of the five original reactor concepts in the Commission's 1954 five year civilian power program. It was designed to produce 20,000 kilowatts of heat and 6,500 kilowatts of electricity.

The purpose of the SRE is to develop the technology associated with the sodium-graphite type of reactor and to provide a flexible tool to develop the advanced technology necessary to achieve economically competitive power. This concept holds promise because of the high temperature, and high efficiencies, at which heat transfer systems using liquid metals can be operated without pressurization.

The reactor has been in operation since April 1957 and has demonstrated the feasibility of the sodium graphite reactor concept. On May 22, 1959 the SRE achieved a maximum steam temperature of 1,000 degrees Fahrenheit. This steam temperature is believed to be the highest ever produced by a nuclear reactor. A second [illegible] loading of thorium-uranium alloy fuel elements has been fabricated [illegible] installed in the near future.

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Parted Fuel Element Seen at Atomics International

During inspection of fuel elements on July 26 at the sodium reactor experiment, operated for the Atomic Energy Commission at Santa Susana by Atomics International, a division of North American Aviation Inc., a parted fuel element was observed.

The fuel element damage is not an indication of unsafe reactor conditions. No release of radioactive materials to the plant or its environs occurred and operating personnel were not exposed to harmful conditions.

In Steel Tubes

The occurrence is of [illegible] portance from a techni[illegible] viewpoint and a detail[illegible] ...way to d[illegible]

fuel element of th[illegible] is a cluster of seven [illegible]less steel tubes, each ap[illegible]ximately three-fourth[illegible]hes in diameter and six feet long.

Each tube contains a column of six-inch long uranium metal slugs. These tubes are capped at the two ends.

The elements are suspended in the core of the reactor by means of hanger rods from plugs in the upper shield.

To date, 34 of the 43 elements comprising the fuel loading of the core have been examined by means of the fuel handling cask television system. Six elements have only an upper portion of the element attached to the hanger rod.

Scheduled for Removal

In each case, all seven tubes of the fuel element cluster were parted and a portion of the end of the fuel element remained in the core.

This fuel loading, nearing the end of its useful life, was scheduled to be removed in the near future.

Preliminary indications are that the damage could have been caused by restrictions in the coolant passages resulting from inadvertent introduction of an organic material into the reactor. This material could have come from leaks in a primary coolant pump where tetralin an organic compound, is used in freeze seals to eliminate sodium leakage into the pump bearings and drive.

First Developed

Preliminary investigation of the stainless steel fuel cladding of one element indicates the element was damaged through formation of a uranium-iron alloy in the cladding in the area of the failure.

The SRE is the first experiment in the Commission's program to develop a sodium graphite reactor, one of the five original reactor concepts in the Commission's 1954 five-year civilian power program. It was designed to produce 20,000 kilowatts of heat and 6500 kilowatts of electricity.

The purpose of the SRE is to develop the technology associated with the sodium-graphite type of reactor and to provide a flexible tool to develop the advanced technology necessary to achieve economically competitive power.

This concept holds promise because of the high temperature, and high efficiences, at which heat transfer systems using liquid metals can be operated without pressurization.

Plan Second Core

The reactor has been in operation since April 1957 and has demonstrated the feasibility of the sodium graphite reactor concept. On May 22, 1959, the SRE achieved a maximum steam temperature of 1000 degrees Fahrenheit. This steam temperature is believed to be the highest ever produced by a nuclear reactor.

A second core loading of thorium-uranium alloy fuel elements has been fabricated and will be installed in the near future.