OFFSHORE POWER SYSTEMS

DOCKET NO. STN 50-437

FLOATING NUCLEAR PLANTS 1-8

MANUFACTURING LICENSE

Manufacturing License No. ML-1

1. The Nuclear Regulatory Commission (the Commission) having found that:

   A. The application for a manufacturing license complies with the requirements of the Atomic Energy Act of 1954, as amended, and the rules and regulations of the Commission, there is reasonable assurance that the activities authorized by the license will be conducted in compliance with the rules and regulations of the Commission, and all required notifications to other agencies or bodies have been duly made;

   B. Offshore Power Systems (the licensee) has described the proposed design of and the site parameters postulated for the Floating Nuclear Plants 1-8, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components incorporated therein for the protection of the health and safety of the public;

   C. Such further technical or design information as may be required to complete the design report, and which can reasonably be left for later consideration, will be supplied in an amendment to the design report;

   D. Safety features or components, if any, which require research development have been described by the licensee and the licensee has identified, and there will be conducted, a research and development program reasonably designed to resolve any safety questions associated with such features or components;

   E. On the basis of the foregoing, there is reasonable assurance that (i) such safety questions will be satisfactorily resolved before any of the proposed floating nuclear plants are removed from the manufacturing site and (ii) taking into consideration the site criteria contained in 10 CFR Part 100, the proposed reactors can be constructed and operated at a site having characteristics that fall within the site parameters postulated for the design of the plants without undue risk to the health and safety of the public;

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F. The licensee is technically qualified to design and manufacture the proposed nuclear power plants;

G. The licensee is financially qualified to design and manufacture the proposed nuclear power plants;

H. The issuance of a license to Offshore Power Systems will not be inimical to the common defense and security or to the health and safety of the public; and

I. After weighing the environmental, economic, technical and other benefits against environmental and other costs and considering available alternatives, the issuance of a manufacturing license subject to the conditions for protection of the environment set forth herein is in accordance with 10 CFR Part 50, Appendix M and 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Pursuant to Section 103 of the Atomic Energy Act of 1954, as amended (the Act), and Title 10, Chapter I, Code of Federal Regulations, Part 50, Appendix M, "Standardization of Design; Manufacture of Nuclear Power Reactors; Construction and Operation of Nuclear Power Reactors Manufactured Pursuant to Commission License," and pursuant to the Initial Decision of the Atomic Safety and Licensing Board, dated June 30, 1982, the Nuclear Regulatory Commission (the Commission) hereby issues a manufacturing license to Offshore Power Systems for the manufacture of a maximum of eight floating nuclear plants, each designed to operate at a core power level of 3411 megawatts thermal, as described in the Plant Design Report as amended (Amendments 1 through 30) and the Environmental Report as supplemented (Supplements 1 through 6) (the application) filed in this matter by the licensee and as more fully described in the evidence received at the public hearing upon that application.

3. This license shall be deemed to contain and be subject to the conditions specified in 10 CFR Sections 50.54 and 50.55 (except 50.55d) of the Commission's regulations; is subject to all applicable provisions of the Act, and rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the conditions specified or incorporated below:

A. Manufacture of the floating nuclear plants shall commence within ten years from the date of issuance of this license. The number of units will be the number whose start of manufacture can practically begin within the ten year period; but in no event will it exceed eight units. The plant design shall be updated no later than five years after the date of this Manufacturing License[1/].

[1/] The approved plant design is reflected in the Plant Design Report, staff SER as supplemented, and the Initial Decision of the Atomic Safety and Licensing Board dated June 30, 1982.

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B. The floating nuclear plants shall be constructed at the site as described in the application, on Blount Island of St. John's River in Jacksonville, Florida.

C. This license authorizes the licensee to construct the floating nuclear plants as described in the application (including the Plant Design Report) and the hearing record, in accordance with the principal architectural and engineering criteria and commitments set forth therein.

D. This license is subject to the following conditions for the protection of the environment:

(1) Environmental Protection Plan in Appendix A attached hereto is hereby incorporated in this license. The licensee shall conduct activities under the license in accordance with this plan.

(2) Before engaging in any manufacturing activity which may result in a significant adverse environmental impact that was not evaluated or that is significantly greater than that evaluated in the Final Environmental Statement, Part I (NUREG-75/091), the licensee shall provide written notification to the Director, Office of Nuclear Reactor Regulation.

(3) If unexpected harmful effects or evidence of irreversible damage are detected during the manufacture or preoperational testing of the floating nuclear plants, the licensee shall provide an acceptable analysis of the problem and a plan of action to eliminate or significantly reduce these harmful effects or this damage.

(4) The licensee shall maintain a core ladle in the plant design and shall obtain NRC approval of the final core ladle design prior to the start of construction of any major element of the floating nuclear plant hull structure (See Section VIII of Supplement 3 to the Safety Evaluation Report, NUREG-0054).

(5) The licensee shall inform applicants who file applications for construction permits to site and operate floating nuclear plants at

specific locations of the siting requirements specified in the Final Environmental Statement (NUREG-0502), Part III: "A Comparison of Overall Risk from Accidental Releases of Radioactivity to the Environment for Floating and Land-Based Nuclear Power Plants and an Integrated Cost-Benefit Analysis for the Floating Nuclear Plant Concept."

E. The licensee shall perform, within two years after the issuance of this license, an evaluation of alternative hydrogen control systems that provide, with reasonable assurance, that:

(a) Uniformly distributed hydrogen concentrations in the containment do not exceed 10% during and following an accident that releases an equivalent amount of hydrogen as would be generated from a 100% fuel clad metal-water reaction or that the post-accident atmosphere will not support hydrogen combustion.

(b) Combustible concentrations of hydrogen will not collect in areas where unintended combustion or detonation could cause loss of containment integrity or loss of appropriate mitigating features.

(c) Equipment necessary for achieving and maintaining safe shutdown of the plant and maintaining containment integrity will perform its safety function during and after being exposed to the environmental conditions attendant with the release of hydrogen generated by the equivalent of a 100% fuel clad metal-water reaction including the environmental conditions created by activation of the hydrogen control system.

(d) Inadvertent activation of a post-accident inerting system can be safely accommodated during plant operation.

The evaluation shall as a minimum include consideration of a hydrogen ignition system and a post-accident inerting system. The evaluation shall include:

(a) A comparison of costs and benefits of the alternative systems considered.

(b) For the selected system, analyses and test data to verify compliance with the requirements of 1(a), 1(b), 1(c), and 1(d) of this condition.

(c) For the selected system, preliminary design descriptions of equipment, function, and layout.

F. This license is subject to the following additional conditions:

(1) The manufacturing conditions are incorporated in Amendment No. 22 to the Plant Design Report and the licensee shall manufacture the Floating Nuclear Plants in accordance with these requirements.

(2) The licensee shall design and manufacture the Floating Nuclear Plants so as to assure compliance with applicable U.S. Coast Guard regulations necessary to obtain the issuance of a Certificate of Inspection.

(3) The licensee is required to perform a testing program as described in SER Supplement No. 3, Section VI, which will supply additional information and data regarding core ladle thermal performance.

4. The Licensee shall submit to the Commission, in the form of an application of amendment to this license, the final design of the nuclear power reactors covered by this license as soon as such design has been completed. No nuclear power reactor manufactured pursuant to this license shall be removed from the manufacturing site until the final design of the reactors has been approved by the Commission in an amendment to this license.

5. This license is effective as of the date of issuance and shall expire at midnight, December 31, 1999.

FOR THE NUCLEAR REGULATORY COMMISSION

S/

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Attachment:
Appendix A, Environmental Protection Plan

Date of Issuance: December 17, 1982

*NOTE: SEE PREVIOUS WHITE FOR CONCURRENCE

DIR:DL DE Eisenhut 12/17/82 | DD:NRR EGCase 12/ /82 | DIR:NRR HRDenton 12/17/82

OFFICE	LA:DL:LB #4	DL:LB #4	OELD	AEAB	AD:SP	DL:LB #4	AD:L:DL
SURNAME	MDuncan/tmc	CStahle		ATgalston	JSaltzman	EAdensam	JNovak
DATE	9/ /82	9/ /82	9/ /82	9/ /82	9/ /82	9/ /82	9/ /82

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FOR THE NUCLEAR REGULATORY COMMISSION

/s/

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Attachment:
Appendix A, Environmental Protection Plan

Date of Issuance: December 17, 1982

*NOTE: SEE PREVIOUS WHITE FOR CONCURRENCE

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OFFICE	LA:DL:LB #4	DL:LB #4	OELD	AEAB	AD:SP	DL:LB #4	AD:L:DL
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FOR THE NUCLEAR REGULATORY COMMISSION

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Attachment:
Appendix A, Environmental Protection Plan

Date of Issuance:

9/30/82

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9/ /82

*SEE PREVIOUS CONCURRENCE

OFFICE	I.A:DL:LB #4	DL:LB #4	OELD	AEAB	AD:SP	DL:LB #4	AD:L:DL
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DATE	9/ /82	9/ /82	9/ /82	9/ /82	9/ /82	9/ /82	9/ /82

F. This license is subject to the following additional conditions:

(1) The manufacturing conditions are incorporated in Amendment No. 22 to the Plant Design Report and the licensee shall manufacture the Floating Nuclear Plants in accordance with these requirements.

(2) The licensee shall design and manufacture the Floating Nuclear Plants so as to assure compliance with applicable U.S. Coast Guard regulations necessary to obtain the issuance of a Certificate of Inspection.

(3) The licensee is responsible for factoring physical protection into the design wherever possible and for advising purchasers of Floating Nuclear Plants of all available methods of factoring physical security into siting and operation of plants.

4. The Licensee shall submit to the Commission, in the form of an application of amendment to this license, the final design of the nuclear power reactors covered by this license as soon as such design has been completed. No nuclear power reactor manufactured pursuant to this license shall be removed from the manufacturing site until the final design of the reactors has been approved by the Commission in an amendment to this license.

5. This license is effective as of the date of issuance and shall expire at midnight, December 31, 1999.

FOR THE NUCLEAR REGULATORY COMMISSION

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Attachment:
Appendix A, Environmental Protection Plan

Date of Issuance:

DIR:DL
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9/ /82

OFFICE	LA:DL:LB #4	DL:LB #4	OELD	AEAB	AD:SP	DL:LB #4	AD:L:DL
SURNAME	MDuncan/hmc	CStahle		AToalston	JSaltzman	EAdensam	TNovak
DATE	9/24/82	9/ /82	9/ /82	9/29/82	9/29/82	9/ /82	9/ /82

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO: 1981—335-960

APPENDIX A

TO MANUFACTURING LICENSE NO. ML- 1

FLOATING NUCLEAR PLANTS 1-8

OFFSHORE POWER SYSTEMS

DOCKET NO. STN 50-437

ENVIRONMENTAL PROTECTION PLAN

(NON-RADIOLOGICAL)

1.0 Objectives of the Environmental Protection Plan

The Environmental Protection Plan (EPP) is to provide for protection of environmental values during operation of the manufacturing facility. The principal objectives of the EPP are as follows:

(1) Verify that the facility is operated in an environmentally acceptable manner, as established by the FES and other NRC environmental impact assessments.

(2) Coordinate NRC requirements and maintain consistency with other Federal, State and local requirements for environmental protection.

(3) Keep NRC informed of the environmental effects of floating nuclear plant design changes and manufacturing facility operation and of actions taken to control those effects.

Environmental concerns identified in the FES which relate to water quality matters are regulated by way of the licensee's NPDES permit.

2.0 Environmental Protection Issues

In the FES dated October 1975, the staff considered the environmental impacts associated with the manufacture of Floating Nuclear Power Plants. Certain environmental issues were identified which required study or license conditions to resolve environmental concerns and to assure adequate protection of the environment.

2.1 Aquatic Issues

Specific aquatic issues raised by the staff in the FES were:

(1) The need for aquatic monitoring programs during preoperational testing of FNP's to confirm that chlorine releases are controlled within those discharge concentrations evaluated, and that adverse effects on aquatic biota in the testing-berth do not occur as a result of ionic copper content in the FNP discharge.

(2) The need for special studies to document levels of intake, entrainment and impingement during preoperational testing of FNP's.

(3) The need for a monitoring program to detect increases in turbidity and smothering of benthos during periods of maintenance dredging and resulting spoil deposition and draining.

(FES-OL: Summary and Conclusions and Sections 4.1.2, 4.1.4 and 5.2.3)

Aquatic issues are addressed by the effluent limitations, monitoring requirements and the effective NPDES permit issued and implemented by the Florida Department of Pollution Control The NRC will rely on this agency for regulation of matters involving water quality and aquatic biota.

2.2 Terrestrial Issues

No terrestrial issues requiring monitoring programs were identified by the staff in its environmental review related to the manufacture of floating nuclear plants.

3.0 Consistency Requirements

3.1 Plant Design and Manufacturing Activities

Before making an FNP design change or before engaging in a manufacturing activity* either of which is determined by the licensee to involve or cause an unreviewed environmental question, the licensee shall obtain prior approval from the NRC.

An FNP design change or a manufacturing activity shall be deemed to involve an unreviewed environmental question if it concerns (1) a matter which may result in a significant increase in any adverse environmental impact previously evaluated in the final environmental statement (FES) as modified by staff's testimony to the Atomic Safety and Licensing Board, supplements to the FES, environmental impact appraisals, or in any decisions of the Atomic Safety and Licensing Board ; or (2) a significant change in effluents (in accordance with 10 CFR Part 51.5(b)(2)); or (3) a matter not previously reviewed and evaluated in the documents specified in (1) of this Subsection, which may have a significant adverse environmental impact.

*Manufacturing activity means an operation conducted at the manufacturing facility (1) for the purpose of FNP fabrication of testing of (2) for the purpose of controlling the environmental impact of FNP fabrication or testing.

The licensee shall maintain records of changes in facility design or operation and of tests and experiments carried out pursuant to this Subsection. These records shall include a written evaluation which provides bases for the determination that the change, test, or experiment does not involve an unreviewed environmental question.

Activities governed by Section 3.3 of this EPP are not subject to the requirements of this section.

3.2 Reporting Related to the NPDES Permit and State Certification (pursuant to Section 401 of the Clean Water Act)

(1) Violations of the NPDES Permit or the State 401 Certification Conditions shall be reported to the NRC by submittal of copies of the reports required by the NPDES Permit or State 401 Certification.

(2) The licensee shall provide the NRC with a copy of any 316(a) or (b) studies and/or related documentation at the same time it is submitted to the permitting agency.

(3) Changes and additions to the NPDES Permit or the State 401 Certification shall be reported to the NRC within 30 days following the date the change is approved. If a permit or certification, in part or in its entirety, is appealed and stayed, the NRC shall be notified within 30 days following the date the stay is granted.

(4) The NRC shall be notified of changes to the effective NPDES Permit proposed by the licensee by providing NRC with a copy of the proposed change at the same time it is submitted to the permitting agency. The licensee shall provide the NRC a copy of the application for renewal of the NPDES Permit at the same time the application is submitted to the permitting agency.

3.3 Changes Required for Compliance with Other Environmental Regulations

Changes which would otherwise be within the scope of subsection 3.1, but which are required to achieve compliance with other Federal, State, or local environmental regulations are not subject to the requirements of Section 3.1.

4.1 Significant Environmental Events

(1) Any occurrence which does or could result in significant environmental impact related to the matters authorized under this license which is required to be reported to any other Federal, State or local agency shall at the same time and in a like manner be reported to the NRC.

The licensee shall maintain records of changes in facility design or operation and of tests and experiments carried out pursuant to this Subsection. These records shall include a written evaluation which provides bases for the determination that the change, test, or experiment does not involve an unreviewed environmental question.

Activities governed by Section 3.3 of this EPP are not subject to the requirements of this section.

3.2 Reporting Related to the NPDES Permit and State Certification (pursuant to Section 401 of the Clean Water Act)

(1) Violations of the NPDS Permit or the State 401 Certification Conditions shall be reported to the NRC by submittal of copies of the reports required by the NPDES Permit or State 401 Certification.

(2) The licensee shall provide the NRC with a copy of any 316(a) or (b) studies and/or related documentation at the same time it is submitted to the permitting agency.

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Changes which would otherwise be within the scope of subsection 3.1, but which are required to achieve compliance with other Federal, State, or local environmental regulations are not subject to the requirements of Section 3.1.

4.1 Significant Environmental Events

(1) Any occurance which does or could result in significant environmental impact related to the matters authorized under this license which is required to be reported to any other Federal, State or local agency shall at the same time and in a like manner be reported to the NRC.

(2) Any other occurrence which does or could result in a significant environmental impact related to matters authorized under this license shall be recorded and promptly reported to the NRC within 24 hours of the occurrence. No routine monitoring programs are required by the NRC to implement this condition.

(3) A written report shall be made within 30 days on any occurrence reported under the foregoing paragraph. The written report shall (a) describe, analyze, and evaluate the event, including extent and magnitude of the impact, (b) describe the manufacturing facility conditions at the time of the event, (c) describe the probable cause of the event, (d) indicate the action taken to correct the reported event, (e) indicate the corrective action taken to preclude repetition of the event and to prevent similar occurrences involving similar components or systems, and (f) indicate the agencies notified and their preliminary responses.

(4) The following are examples of significant environmental events: excessive bird impaction events; onsite plant or animal disease outbreaks; mortality or unusual occurrence of any species protected by the Endangered Species Act of 1973; unusual fish kills; and increase in nuisance organisms or conditions.