AM	TENDMENT NO Calendar No
Pui	rpose: To establish the Next Generation Nuclear Plant Project.
IN '	THE SENATE OF THE UNITED STATES—109th Cong., 1st Sess.
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7	To enhance the energy security of the United States, and for other purposes.
Ref	Gerred to the Committee onand ordered to be printed
	Ordered to lie on the table and to be printed
Ам	ENDMENT intended to be proposed by to Title VI—Nuclear Matters (END05442.LC)
Viz	;
1	At the end of the title, add the following:
2	Subtitle D—Next Generation
3	<b>Nuclear Plant Project</b>
4	SEC. 661. PROJECT ESTABLISHMENT.
5	(a) Establishment.—The Secretary shall establish
6	a project to be known as the "Next Generation Nuclear
7	Plant Project" (referred to in this subtitle as the
8	"Project").

1	(b) Content.—The Project shall consist of the re-
2	search, development, design, construction, and operation
3	of a prototype plant, including a nuclear reactor that—
4	(1) is based on research and development activi-
5	ties supported by the Generation IV Nuclear Energy
6	Systems Initiative under section 942(d); and
7	(2) shall be used—
8	(A) to generate electricity;
9	(B) to produce hydrogen; or
10	(C) both to generate electricity and to
11	produce hydrogen.
12	SEC. 662. PROJECT MANAGEMENT.
13	(a) Departmental Management.—
14	(1) In general.—The Project shall be man-
15	aged in the Department by the Office of Nuclear
16	Energy, Science, and Technology.
17	(2) Generation iv nuclear energy sys-
18	TEMS PROGRAM.—The Secretary may combine the
19	Project with the Generation IV Nuclear Energy Sys-
20	tems Initiative.
21	(3) Existing doe project management ex-
22	PERTISE.—The Secretary may utilize capabilities for
23	review of construction projects for advanced sci-
24	entific facilities within the Office of Science to track
25	the progress of the Project.

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1	(b) Laboratory Management.—
2	(1) Lead Laboratory.—The Idaho National
3	Laboratory shall be the lead National Laboratory for
4	the Project and shall collaborate with other National
5	Laboratories, institutions of higher education, other
6	research institutes, industrial researchers, and inter-
7	national researchers to carry out the Project.
8	(2) Industrial partnerships.—
9	(A) In General.—The Idaho National
10	Laboratory shall organize a consortium of ap-
11	propriate industrial partners that will carry out
12	cost-shared research, development, design, and
13	construction activities, and operate research fa-
14	cilities, on behalf of the Project.
15	(B) Cost-sharing.—Activities of indus-
16	trial partners funded by the Project shall be
17	cost-shared in accordance with section 1002.
18	(C) Preference in deter-
19	mining the final structure of the consortium or
20	any partnerships under this subtitle shall be
21	given to a structure (including designating as a
22	lead industrial partner an entity incorporated in

the United States) that retains United States

technological leadership in the Project while

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1	maximizing cost sharing opportunities and
2	minimizing Federal funding responsibilities.
3	(3) PROTOTYPE PLANT SITING.—The prototype
4	nuclear reactor and associated plant shall be sited at
5	the Idaho National Laboratory in Idaho.
6	(4) REACTOR TEST CAPABILITIES.—The
7	Project shall use, if appropriate, reactor test capa-
8	bilities at the Idaho National Laboratory.
9	(5) OTHER LABORATORY CAPABILITIES.—The
10	Project may use, if appropriate, facilities at other
11	National Laboratories.
12	SEC. 663. PROJECT ORGANIZATION.
13	(a) Major Project Elements.—The Project shall
14	consist of the following major program elements:
15	(1) High-temperature hydrogen production
16	technology development and validation.
17	(2) Energy conversion technology development
18	and validation.
19	(3) Nuclear fuel development, characterization,
20	and qualification.
21	(4) Materials selection, development, testing,
22	and qualification.
23	(5) Reactor and balance-of-plant design, engi-
24	neering, safety analysis, and qualification.

1	(b) Project Phases.—The Project shall be con-
2	ducted in the following phases:
3	(1) First project phase.—A first project
4	phase shall be conducted to—
5	(A) select and validate the appropriate
6	technology under subsection (a)(1);
7	(B) carry out enabling research, develop-
8	ment, and demonstration activities on tech-
9	nologies and components under paragraphs (2)
10	through (4) of subsection (a);
11	(C) determine whether it is appropriate to
12	combine electricity generation and hydrogen
13	production in a single prototype nuclear reactor
14	and plant; and
15	(D) carry out initial design activities for a
16	prototype nuclear reactor and plant, including
17	development of design methods and safety ana-
18	lytical methods and studies under subsection
19	(a)(5)
20	(2) SECOND PROJECT PHASE.—A second
21	project phase shall be conducted to—
22	(A) continue appropriate activities under
23	paragraphs (1) though (5) of subsection (a);

1	(B) develop, through a competitive process,
2	a final design for the prototype nuclear reactor
3	and plant;
4	(C) apply for licenses to construct and op-
5	erate the prototype nuclear reactor from the
6	Nuclear Regulatory Commission; and
7	(D) construct and start up operations of
8	the prototype nuclear reactor and its associated
9	hydrogen or electricity production facilities.
10	(c) Project Requirements.—
11	(1) In General.—The Secretary shall ensure
12	that the Project is structured so as to maximize the
13	technical interchange and transfer of technologies
14	and ideas into the Project from other sources of rel-
15	evant expertise, including—
16	(A) the nuclear power industry, including
17	nuclear powerplant construction firms, particu-
18	larly with respect to issues associated with
19	plant design, construction, and operational and
20	safety issues;
21	(B) the chemical processing industry, par-
22	ticularly with respect to issues relating to—
23	(i) the use of process energy for pro-
24	duction of hydrogen; and

1	(ii) the integration of technologies de-
2	veloped by the Project into chemical proc-
3	essing environments; and
4	(C) international efforts in areas related to
5	the Project, particularly with respect to hydro-
6	gen production technologies.
7	(2) International collaboration.—
8	(A) In General.—The Secretary shall
9	seek international cooperation, participation
10	and financial contributions for the Project.
11	(B) Assistance from international
12	PARTNERS.—The Secretary, through the Idaho
13	National Laboratory, may contract for assist-
14	ance from specialists or facilities from member
15	countries of the Generation IV International
16	Forum, the Russian Federation, or other inter-
17	national partners if the specialists or facilities
18	provide access to cost-effective and relevant
19	skills or test capabilities.
20	(C) Partner nations.—The Project may
21	involve demonstration of selected project objec-
22	tives in a partner country.
23	(D) GENERATION IV INTERNATIONAL
24	FORUM.—The Secretary shall ensure that inter-

1	national activities of the Project are coordinated				
2	with the Generation IV International Forum.				
3	(3) REVIEW BY NUCLEAR ENERGY RESEARCH				
4	ADVISORY COMMITTEE.—				
5	(A) In General.—The Nuclear Energy				
6	Research Advisory Committee of the Depart-				
7	ment (referred to in this paragraph as the				
8	"NERAC") shall—				
9	(i) review all program plans for the				
10	Project and all progress under the Project				
11	on an ongoing basis; and				
12	(ii) ensure that important scientific,				
13	technical, safety, and program manage-				
14	ment issues receive attention in the Project				
15	and by the Secretary.				
16	(B) Additional expertise.—The				
17	NERAC shall supplement the expertise of				
18	NERAC or appoint subpanels to incorporate				
19	into the review by NERAC the relevant sources				
20	of expertise described under paragraph (1).				
21	(C) Initial review.—Not later than 180				
22	days after the date of enactment of this Act,				
23	the NERAC shall—				
24	(i) review existing program plans for				
25	the Project in light of the recommenda-				

1	tions of the document entitled "Design
2	Features and Technology Uncertainties for
3	the Next Generation Nuclear Plant," dated
4	June 30, 2004; and
5	(ii) address any recommendations of
6	the document not incorporated in program
7	plans for the Project.
8	(D) First project phase review.—On
9	a determination by the Secretary that the ap-
10	propriate activities under the first project phase
11	under subsection (b)(1) are nearly complete, the
12	Secretary shall request the NERAC to conduct
13	a comprehensive review of the Project and to
14	report to the Secretary the recommendation of
15	NERAC concerning whether the Project is
16	ready to proceed to the second project phase
17	under subsection $(b)(2)$ .
18	(E) Transmittal of reports to con-
19	GRESS.—Not later than 60 days after receiving
20	any report from the NERAC related to the
21	Project, the Secretary shall submit to the ap-
22	propriate committees of the Senate and the
23	House of Representatives a copy of the report,
24	along with any additional views of the Secretary
25	that the Secretary may consider appropriate.

1	SEC 6	CA NITICI	EAD DECIN	ATODV	COMMISSION.
1	SEC. 6	64. NUCL	KAR KKCHU	AIORY	COMMISSION

2	(a) In General.—In accordance with section 202 of
3	the Energy Reorganization Act of 1974 (42 U.S.C. 5842),
4	the Nuclear Regulatory Commission shall have licensing
5	and regulatory authority for any reactor authorized under
6	this subtitle.
7	(b) Licensing Strategy.—Not later than 3 years
8	after the date of enactment of this Act, the Secretary and
9	the Chairman of the Nuclear Regulatory Commission shall
10	jointly submit to the appropriate committees of the Senate
11	and the House of Representatives a licensing strategy for
12	the prototype nuclear reactor, including—
13	(1) a description of ways in which current li-
14	censing requirements relating to light-water reactors
15	need to be adapted for the types of prototype nu-
16	clear reactor being considered by the Project;
17	(2) a description of analytical tools that the
18	Nuclear Regulatory Commission will have to develop
19	to independently verify designs and performance
20	characteristics of components, equipment, systems,
21	or structures associated with the prototype nuclear
22	reactor;
23	(3) other research or development activities that
24	may be required on the part of the Nuclear Regu-
25	latory Commission in order to review a license appli-
26	cation for the prototype nuclear reactor; and

1	(4) an estimate of the budgetary requirements
2	associated with the licensing strategy.
3	(c) Ongoing Interaction.—The Secretary shall
4	seek the active participation of the Nuclear Regulatory
5	Commission throughout the duration of the Project to—
6	(1) avoid design decisions that will compromise
7	adequate safety margins in the design of the reactor
8	or impair the accessibility of nuclear safety-related
9	components of the prototype reactor for inspection
10	and maintenance;
11	(2) develop tools to facilitate inspection and
12	maintenance needed for safety purposes; and
13	(3) develop risk-based criteria for any future
14	commercial development of a similar reactor archi-
15	tectures.
16	SEC. 665. PROJECT TIMELINES AND AUTHORIZATION OF
17	APPROPRIATIONS.
18	(a) Target Date to Complete the First
19	PROJECT PHASE.—Not later than September 30, 2011—
20	(1) the Secretary shall select the technology to
21	be used by the Project for high-temperature hydro-
22	gen production and the initial design parameters for
23	the prototype nuclear plant; or
24	(2) submit to Congress a report establishing an
25	alternative date for making the selection.

1	(b) Design Competition for Second Project
2	Phase.—
3	(1) In General.—The Secretary, acting
4	through the Idaho National Laboratory, shall fund
5	not more than 4 teams for not more than 2 years
6	to develop detailed proposals for competitive evalua-
7	tion and selection of a single proposal for a final de-
8	sign of the prototype nuclear reactor.
9	(2) Systems integration.—The Secretary
10	may structure Project activities in the second project
11	phase to use the lead industrial partner of the com-
12	petitively selected design under paragraph (1) in a
13	systems integration role for final design and con-
14	struction of the Project.
15	(e) Target Date to Complete Project Con-
16	STRUCTION.—Not later than September 30, 2021—
17	(1) the Secretary shall complete construction
18	and begin operations of the prototype nuclear reac-
19	tor and associated energy or hydrogen facilities; or
20	(2) submit to Congress a report establishing an
21	alternative date for completion.
22	(d) Authorization of Appropriations.—There is
23	authorized to be appropriated to the Secretary for re-
24	search and construction activities under this subtitle (in-

1	cluding for transfer to the Nuclear Regulatory Commis-
2	sion for activities under section 664 as appropriate)—
3	(1) \$1,250,000,000 for the period of fiscal
4	years 2006 through 2015; and
5	(2) such sums as are necessary for each of fis-
6	cal years 2016 through 2021.