and goals sooner or at less cost than anticipated or producing more beneficial results than originally projected.

(4) *Final report.* A final report summarizing the entire investigation must be submitted by the recipient within 90 days after the final project period ends or the award is terminated. Satisfactory completion of an award will be contingent upon the receipt of this report. The final report shall follow the same outline as a progress report. Manuscripts prepared for publication should be appended.

(5) Financial status report (FSR) (OMB No. 0348–0039). The FSR is required within 90 days after completion of each budget period; for budget periods exceeding 12 months, an FSR is also required within 90 days after this first 12 months unless waived by the Contracting Officer.

(b) DOE may extend the deadline date for any report if the recipient submits a written request before the deadline which adequately justifies an extension.

(c) A table summarizing the various types of reports, time for submission, number of copies is set forth below. The schedule of reports shall be as prescribed in this table, unless the award document specifies otherwise.

(d) DOE review of performance. DOE or its authorized representatives may make site visits, at any reasonable time, to review the project. DOE may provide such technical assistance as may be requested.

(e) Subrecipient progress reporting. Recipients may place progress reporting requirements on a subrecipient consistent with the provisions of this section.

DISTRIBUTION AND SCHEDULE OF DOCUMENTS

Type	When due	Number of copies to be submitted
1. Summary: 200 words on scope and purpose (Notice of Energy R&D Project).	Immediately after award and with each application for renewal.	3
2. Renewal	6 months before the project period ends.	8
3. Progress Report	90 days prior to the next budget period (or as part of a renewal application).	3
4. Other progress reports, brief topical reports, etc. (Designated when significant results develop or when work has direct programmatic impact).	As deemed appropriate by the recipient.	3
5. Reprints, Conference papers.	Same as 4 above	3
6. Final Report	Within 90 days after termination of the project.	3
7. Financial Status Report. (FSR).	Within 90 days after completion of the project period; for budget periods exceeding 12 months an FSR is also required within 90 days after the first 12-month period.	3

NOTE: Report types 5 and 6 require with submission two copies of DOE Form 1332.16, University-Type Contractor and Grantee Recommendations for Disposition of Scientific and Technical Document.

§ 605.20 Dissemination of results.

(a) Recipients are encouraged to disseminate project results promptly. DOE reserves the right to utilize, and have others utilize, to the extent it deems appropriate, the reports resulting from awards.

(b) DOE may waive progress reporting requirements set forth in § 605.19, if the recipient submits to DOE a copy of its own report which is published or accepted for publication in a recognized scientific or technical journal and which satisfies the information requirements of the program.

(c) Recipients are urged to publish results through normal publication channels in accordance with the applicable provisions of 10 CFR part 600.

(d) The article shall include an acknowledgment that the project was supported, in whole or in part, by a DOE award, and specify the award number, but state that such support does not constitute an endorsement by DOE of the views expressed in the article.

APPENDIX A TO PART 605—THE ENERGY RESEARCH PROGRAM OFFICE DESCRIPTIONS

1. BASIC ENERGY SCIENCES

This program supports basic science research efforts in a variety of disciplines to broaden the energy supply and technological base knowledge. The major science division and its objectives are as follows:

(a) Energy Biosciences

The primary objective of this program is to generate a basis of understanding of fundamental biological mechanisms in the areas of botanical and microbiological sciences that will support biotechnology development related to energy. The research serves as the basic information foundation with respect to renewable resource productivity for fuels and chemicals, microbial conversions or renewable materials and biological systems for the conservation of energy. This office has special requirements on the submission of preapplications, when to submit, and the length of the preapplication/application; applicants are encouraged to contact the office regarding these requirements.

(b) Chemical Sciences

This program sponsors experimental and theoretical research on liquids, gases, plasmas, and solids. The focus is on their chemical properties and the interactions of their component molecules, atoms, ions, and electrons. The subprogram objective is to expand, through support of basic research, our knowledge in the various areas of chemistry; the long-term goal is to contribute to new or improved processes for developing and using domestic energy resources in an efficient and environmentally sound manner. Disciplinary areas covered include physical, organic, and inorganic chemistry; chemical physics; atomic physics; photochemistry; radiation chemistry; thermodynamics; thermophysics; separations science; analytical chemistry; and actinide chemistry.

(c) Geosciences

The goal of this program is to develop a quantitative and predictive understanding of the energy-related aspects of processes within the earth and at the solar-terrestrial interface. The emphasis is on the upper levels of the earth's crust and the focus is on geophysics and geochemistry of rock-fluid systems and interactions. Specific topical areas receiving emphasis include: High resolution geophysical imaging; fundamental properties of rocks, minerals, and fluids; scientific drilling; and sedimentary basin systems. The resulting improved understanding and knowledge base are needed to assist efforts in the utilization of the Nation's energy resources in an environmentally acceptable fashion.

(d) Engineering Research

This program's objectives are: (1) To extend the body of knowledge underlying current engineering practice in order to open new ways for enhancing energy savings and production, prolonging useful equipment life, and reducing costs while maintaining output and performance quality; and (2) to broaden the technical and conceptual base for solving future engineering problems in the energy technologies. Long-term research topics of current interest include: foundations of bioprocessing of fuels and energy related wastes, fracture mechanics, experimental and theoretical studies of multiphase flows, intelligent machines, and diagnostics and control for plasma processing of materials.

(e) Materials Sciences

The objective of this program is to increase the understanding of phenomena and properties important to materials behavior that will contribute to meeting the needs of present and future energy technologies. It is comprised of the subfields metallurgy, ceramics, solid state physics, materials chemistry, and related disciplines where the emphasis is on the science of materials.

(f) Advanced Energy Projects

The objective of this program is to support exploratory research on novel concepts related to energy. The concepts may be in any field related to energy but must not fall into an area of programmatic responsibility of an existing ER technical program. The research is usually aimed at establishing the scientific feasibility of a concept and, where appropriate, at estimating its economic viability.

2. FIELD OPERATIONS MANAGEMENT

This office administers special purpose support programs that cut across DOE program areas. In conjunction with this activity, it supports related conferences, research, and training initiatives that further these areas of interest.

(a) Laboratory Technology Transfer Program

The ER Laboratory Technology Transfer (LTT) Program has dedicated funding which fulfills the legislative mandate to more effectively transfer research and technology from Energy Research laboratories to industry. By design, this program provides only partial funding for technology research projects and personnel exchanges with industry and universities. Mandatory cost-sharing by industry and other partners ensures that cooperative projects will focus on those that generate real interest in the private sector and facilitate the transfer of technology. The

program supports laboratory-industry personnel exchanges; comprehensive program evaluation; and cost-shared technology research, especially CRADAs to advance precompetitive research projects to a point where they can be evaluated for commercial applications. Other activities of the ER Laboratory Technology Transfer Program include coordinating technology transfer operations throughout the ER laboratory system; coordinating technology transfer elements of the institutional planning process; contributing to Departmental technology transfer policy development; and implementing appropriate outreach activities.

3. FUSION ENERGY

The magnetic fusion energy program is an applied research and development program whose goal is to develop the scientific and technological information required to design and construct magnetic fusion energy systems. This goal is pursued by three divisions, whose major functions are listed below.

(A) APPLIED PLASMA PHYSICS (APP)

This Division seeks to develop that body of physics knowledge which permits advancement of the fusion program on a sound basis. APP research programs provide: (1) The theoretical understanding of fusion plasmas necessary for interpreting results from present experiments, and the planning and design of future confinement devices; (2) the data on plasma properties, atomic physics and new diagnostic techniques for operational support of confinement experiments; research and development of Heavy Ion Fusion Accelerator (HIFAR) and reactor studies in support of the development of Inertial Fusion Energy (IFE).

(B) CONFINEMENT SYSTEMS

This Division has as its primary objective the conduct of research efforts to investigate and resolve basic physics issues associated with medium- to large-scale confinement devices. These devices are used to experimentally explore the limits of specific confinement concepts as well as to study associated physical phenomena. Specific areas of interest include: the production of increased plasma densities and temperatures; the understanding of the physical laws governing plasma energy transport and confinement scaling; equilibrium and stability of high plasma pressure; the investigation of plasma interaction with radio-frequency waves; and the study and control of particle transport in the plasma.

(C) DEVELOPMENT AND TECHNOLOGY

This Division supports research and development of the technology necessary for fabrication and operation of present and future plasma and fusion devices. The program also pursues R&D and system studies pertaining to critical feasibility issues of fusion technology and development.

4. HEALTH AND ENVIRONMENTAL RESEARCH

The goals of this research program are as follows: (1) To provide, through basic and applied research, the scientific information required to identify, understand and anticipate the long-term health and environmental consequences of energy use and development; and (2) to utilize the Department's unique resources to solve major scientific problems in medicine, biology and the environment. The goals of the program are accomplished through the effort of its divisions, which are:

(a) Health Effects and Life Sciences Research

This is a broad program of basic and applied biological research. The objectives are: (1) To develop experimental information from biological systems for estimating or predicting risks of carcinogenesis, mutagenesis, and delayed toxicological effects associated with low level human exposures to energy-related radiations and chemicals; (2) to define mechanisms involved in the induction of biological damage following exposure to low levels of energy-related agents; (3) to develop new technologies for detecting and quantifying latent health effects associated with such agents; (4) to support fundamental research in structural biology user facilities at DOE laboratories; and (5) to create and apply new technologies and resources for characterizing the molecular nature of the human genome.

Increasing emphasis will be placed on: Understanding of mechanisms by which low level exposures to radiation and/or energy-related chemicals produce long-term health impacts; development of new technologies for estimating human health risks from low level exposures; development and application of technologies and approaches for cost-effective characterization of the human genome.

(b) Medical Applications and Biophysical Research

The objectives of this program comprise several areas: (1) To develop new concepts and techniques for detecting and measuring hazardous physical and chemical agents related to energy production; (2) to evaluate chemical and radiation exposures and dosimetry for health protection application; (3) to determine the physical and chemical mechanisms of radiation action in biological systems; and (4) to develop new instrumentation and technology for biological and biomedical research. In addition, Medical Application research is aimed at enhancing the beneficial applications of radiation, and radionuclides, in the diagnosis, study, and treatment of

human diseases. This includes the development of new techniques for radioactive isotope production, labeled pharmaceuticals, imaging devices, and radiation beam applications for the improved diagnosis and therapy of human diseases or the study of human physiological processes. A new area of interest involves the integration of Nuclear Medicine and Molecular Biology. This includes development of radioisotopes and new molecular radiopharmaceutical probes specific to disease-associated targets for improved diagnosis and therapy.

(c) Environmental Sciences

The objectives of the program relate to environmental processes affected by energy production and use. For example, the program develops information on the physical, chemical and biological processes that cycle and transport energy related material and nutrients through the atmosphere, and the ocean margin. Specific emphasis is placed on hydrological transport, mobility and degradation of energy-related contaminants by microorganisms in subsurface systems.

This program also addresses global environmental change from increases in atmospheric carbon dioxide and other greenhouse gases. The scope of the global change program encompasses the carbon cycle, climate modeling and diagnostics, ecosystem responses, the role of the ocean in global change and experiments to quantify the links between greenhouse gas increases and climate change. A new dimension of this program addresses the role of molecular biology in understanding the ecosystem response to global change.

5. HIGH ENERGY AND NUCLEAR PHYSICS

This program supports 90 percent of the U.S. efforts in high energy and nuclear physics. The objectives of these programs are indicated below:

(a) Nuclear Physics (Including Nuclear Data Program)

The primary objectives of this program are an understanding of the interactions and structures of atomic nuclei and nuclear matter at the most elementary level possible, and an understanding of the fundamental forces of nature as manifested in nuclear matter.

(b) High Energy Physics

The primary objectives of this program are to understand the nature and relationships among fundamental forces of nature and to understand the ultimate structure of matter in terms of the properties and interrelations of its basic constituents.

6. SCIENTIFIC COMPUTING STAFF

The goal of this program is to advance the understanding of the fundamental concepts of mathematics, statistics, and computer science underlying the complex mathematical models of the key physical processes involved in the research and development programs of DOE. Broad emphasis is given in three major categories: analytical and numerical methods, information analysis techniques, and advanced concepts.

7. SUPERCONDUCTING SUPER COLLIDER (SSC)

The goals of the Superconducting Super Collider are to build a proton-proton collider with an energy of 20 TeV per proton, to construct and operate experimental systems to study the interactions of these protons, to establish the premier international laboratory for high energy physics reasearch, and to create a major resource for science education. The Office of the Superconducting Super Collider administers research grants associated with the SSC Laboratory's physics, accelerator, and associated technology research and development programs.

8. UNIVERSITY AND SCIENCE EDUCATION

The Office of University and Science Education supports a variety of science, mathematics and engineering education precollege through postgraduate programs aimed at strengthening the Nation's science education and research infrastructure. DOE's education mission has been expanded to include increasing emphasis on the precollege and general public literacy areas. Much of the support involves the use of the unique resources (scientists, facilities and equipment) at DOE's national laboratories and research facilities, and includes research and/or other ''hands-on'' opportunities for precollege and postsecondary students, teachers, and faculty members. In addition to programs centered in DOE facilities, a number of other educational activities are supported, including:

(a) Pre-Freshman Enrichment Program (PREP)

PREP supports projects at colleges and universities aimed at seeking out gindividuals, typically under-represented in science-based careers, during junior high school and early high school years (sixth through tenth grades) and providing these individuals with pre-freshman enrichment activities to identify, motivate and prepare them for science-based careers. Projects must include concentrated, integrated activities that enhance the student's understanding of science and mathematics, must have a summer component at least four weeks in length, and may also include a presummer or post-summer component.

(b) Museum Science Education Program

This program funds museum projects that support the development of the media of informal energy-related science education. The media of informal science education include, but are not limited to: Interactive exhibits, demonstrations, hands-on activities, teacher-student curriculum and film/video/software productions. Examples of energy-related subjects include, but are not limited to: high energy and nuclear physics, nuclear science and technologies, global warming, waste management, energy efficiency, new materials development, fossil energy resources, renewable technologies, risk assessment, energy/environment and other timely topics. The purpose of the program is the development and use of creative informal science education media which focus on energy-related science and technology.

(c) University Research Instrumentation Program

The University Research Instrumentation Program has been developed as part of an interagency effort under the coordination of the Office of Science and Technology Policy to help alleviate the overall shortage of sophisticated state-of-the-art instruments required for advanced scientific and technical research at universities. The overall program objective is to assist university and college scientists in strengthening their capabilities to conduct long-range experimental/scientific research in specific energy areas of direct interest to DOE through the acquisition of large scientific/technical pieces of equipment. Only those colleges and universities that currently have DOE funded research projects, which require the requested equipment, totalling at least $150,000 in the specific area will be selected (more complete eligibility guidelines and principal research areas of particular DOE interest in any given year are available from the program office). Smaller research instruments (less than $100,000 each) are not eligible for consideration in this program. No specific fraction of cost sharing is required but the level of non-Federal funds to be provided will be considered in final selection of awards under the program.

(d) Experimental Program To Stimulate Competitive Research

The purpose of the DOE Experimental Program to Stimulate Competitive Research is to enhance the capabilities of the eligible designated States to develop science and engineering manpower in energy-related areas and to conduct nationally competitive energy-related research. Planning committees within eligible States may apply for planning, implementation and/or training efforts (list of eligible States and activities to be supported in any given year as well as cost-sharing requirements are available from the program office). Separate applications for planning/implementation and graduate traineeships are required. Planning/implementation applications must contain information that details development of a Statewide improvement plan for energy-related research and human resources, while training grant applications must detail the need for energy-related specific and technical educational disciplines.

(e) Nuclear Engineering Research

The objective of this program is to support research efforts aimed at strengthening University-based nuclear engineering programs. Specific areas of basic and applied research of interest include, but are not limited to: (1) Material behavior in a radiation environment typical of advanced nuclear power plants; (2) real-time instrumentation that identifies and applies innovative measurements technologies in nuclear-related fields; (3) advanced nuclear reactor concepts; (4) applied nuclear sciences that address improvements in the applications of radiation and the understanding of the interaction of radiation with matter; (5) engineering science research applicable to advanced nuclear reactor concepts, industry safety and reliability concerns; (6) neutronics that address improvements in reactor computational methodologies and knowledge of the basic fission processes; and (7) nuclear thermal hydraulics that address improvements of models and analysis of thermal hydraulic behavior in an advanced nuclear reactor system.

(f) Used Energy-Related Laboratory Equipment (ERIE) Program

In accordance with DOE's responsibility to encourage research and development in the energy area, grants of used energy-related laboratory equipment for use in energy-oriented educational programs in the life, physical and environmental sciences, and engineering are available to universities, colleges and other non-profit educational institutions of higher learning in the United States. An institution is not required to have a current DOE grant or contract in order to participate in this program. The program office should be contacted for specific information on how to access the list of eligible equipment under this program. The cost of care and handling incident to the grant must be borne by the institution.

9. PROGRAM ANALYSIS

The Office of Program Analysis conducts assessments to identify research opportunities in specific areas of interest to DOE programs.