UNIVERSITY OF FLORIDA

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March 27, 2002

Updated Proposal to Meet Requirements of 10 CFR 50.64(c)(2)

Director
Office of Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir/Madam:

Re: University of Florida Training Reactor (UFTR)
Facility License R-56; Docket No. 50-83

Enclosed is an updated proposal intended to meet the requirements of 10 CFR 50.64(c)(2). Except for scheduling, this proposal is essentially unchanged from that originally submitted with a cover letter dated March 26, 1987 and later revised as to its schedule pursuant to a request from the NRC Project Manager Theodore Michaels dated April 17, 1987. This revised schedule was submitted with a cover letter dated May 14, 1987. It is also essentially unchanged from the updated proposals submitted in March of subsequent years except for the revised schedule and the presence of substantive information on progress to date including the final fuel bundle design.

The updated written proposal outlines how the R-56 licensee intends to meet the requirements of 10 CFR 50.64 Paragraph(c)(2) to include certification that funding for conversion had been received through the Department of Energy for the first phase of the project and a tentative schedule for conversion based upon availability of replacement fuel acceptable to the Commission and upon consideration of the availability of additional funding, shipping casks, implementation of arrangements for the available financial support and allowing for commitments of reactor usage. The schedule had slipped significantly in previous years due to delays in work to qualify the SPERT fuel and due to delays in safety analysis as we awaited code implementation and availability of graduate students for the work. The delays in work with the SPERT fuel were most significant in 1988 and 1989 as the SPERT fuel had to be moved, under the SNM-1050 license, and then various license changes approved prior to initiation of the

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qualification work which was lengthy and subject to several equipment (X-ray machine) failures. The non-destructive testing of the SPERT fuel was completed successfully by April 1989; however, shielding and other structural changes necessitated by use of the SPERT fuel resulted in a decision in August 1989 to utilize plate-type silicide fuel for the conversion. With this decision made, work was then expected to progress more rapidly as the code methodology for safety analyses was being implemented and tested in parallel.

Unfortunately, the decision by the graduate student performing this work to leave the university to pursue his degree elsewhere in August 1989 necessitated essentially restarting the safety analysis when a student began work on it for his thesis in early 1990. Although he spent a week at Argonne National Laboratory working with the RERTR group to receive training in the use of the codes, it still took time for the student to become proficient in the use of the codes. Unfortunately several flaws in the implemented codes used for the neutronics analysis also slowed progress though these were cleared up in early 1991.

In April 1991, a student project concluded the benchmarking neutronics analysis on the existing HEU core demonstrating acceptability of the static neutronics methodology to model the existing core. Similarly a thesis project concluded in May 1991 produced the static neutronics analysis for the proposed LEU core with the number of fuel plates per bundle now set at 14. DOE-supplied funding support of this work was extended beyond April 30, 1991 but this was not accomplished until March 1992 resulting in some delays due to administrative problems. Nevertheless, the complementary basic thermal hydraulic analysis and other analysis work required to conclude the HEU to LEU safety analysis was undertaken and had been nearly completed as work had been underway in the 1993-94 year to prepare the safety analysis report package required for the NRC. Delays were then involved because of the inability to get the existing grant support extended to allow project completion up to SAR submittal. The grant support was finally extended in late November 1994, but little work was accomplished as the funding remaining in the grant was for support of a non-permanent employee (student) who had not been identified. In early April 1995, DOE advised they would extend the grant with its remaining support through March 31, 1996. The same situation was repeated in 1996 for continuing the support through March 31, 1997 whereupon we learned the support funding category could be changed to allow completion of work through submittal of SAR changes. This change was to require some time as we again sought to extend the grant with much work completed by a visiting professor through July 1999. Subsequently, a graduate student essentially completed work for the HEU to LEU conversion submittal in December 2000.

We have also been working with the Department of Energy in Idaho to assure fuel availability in a timely manner and to make decisions on utilization of the existing fuel boxes. The final design review on the fuel is in progress and questions about holddown devices were cleared up by DOE in early 1995. Only a very small piece of the neutronics analysis remained to be completed.

During 1997-99, work continued with a number of verification calculations completed along with alternate methodology being applied to provide reliable analyses. This work was essentially completed with only some control blade worth calculations remaining which were completed as of December 2000. The entire package is being assembled for submission to NRC within two months of DOE indicating LEU fuel will be made available with the project progressing as predicted in the enclosed updated proposal. Currently, as noted in the proposal, DOE has indicated there is no money for conversion in fiscal year 2001 (Phase II) and they are not sure about 2002 as they have indicated plans to wait until the UFTR confirms intentions to relicense by submitting a timely relicensing package fro its R-56 license which expires on August 30, 2002. The submittal to NRC will be prepared and submitted whenever DOE indicates the conversion money will be provided and subsequently the replacement LEU fuel will be made available, although DOE has discussed waiting until late 2002 or even later to make support for fuel and conversion available. Nevertheless, we expect to complete a submission within two months of DOE indicating availability of support.

Another area involved considerable time commitments during 1999 and then 2000. This was the effort to ship the SNM-1050 SPERT fuel. DOE finally accepted this fuel for return on August 31, 2000 as we followed through on assuring it was shipped to a secure DOE facility. Our facility is now released for other uses.

If further information is needed, please advise. Thank you for your consideration.

Sincerely,

William G. Vernetson
Director of Nuclear Facilities

WGV/dms
Enclosure

cc: Reactor Safety Review Subcommittee

Sworn and subscribed this 27th day of March 2002.

Notary Public

Daniel J. Sanetz
MY COMMISSION # DD061176 EXPIRES
September 30, 2005
BONDED THRU TROY FAIN INSURANCE, INC.

UNIVERSITY OF FLORIDA TRAINING REACTOR

FACILITY LICENSE NUMBER: R-56

UPDATED PROPOSAL SUBMITTED TO THE NUCLEAR REGULATORY COMMISSION TO MEET 10 CFR 50.64 REQUIREMENTS FOR UPDATING SCHEDULING OF UFTR CONVERSION FROM HEU TO LEU FUEL

Dr. William G. Vernetson
Director of Nuclear Facilities

March 27, 2002

UNIVERSITY OF FLORIDA TRAINING REACTOR FUEL CONVERSION FROM HIGH ENRICHED TO LOW ENRICHED URANIUM FUEL

INTRODUCTION

This proposal is submitted to the Nuclear Regulatory Commission to meet the requirement that the licensee for the University of Florida Training Reactor (UFTR), as a licensee of a non-power reactor authorized to possess and use high enriched uranium (HEU) fuel shall develop and submit a proposal to replace all HEU fuel possessed under the R-56 license with available low enriched uranium (LEU) fuel acceptable to the Nuclear Regulatory Commission on a schedule determined pursuant to 10 CFR 50.64 Paragraph (c)(2). This proposal addresses the overall process of conversion from initial preparations following receipt of funding to support conversion to final verification, testing, and summary reporting on the converted UFTR. Three primary phases have been identified for control and administration of the overall process of conversion as follows:

I. Preparation for Conversion

II. Conversion (assuming NRC order to convert)

III. Review and Verification of Conversion

Table I contains a listing of key activities involved in each phase of the conversion from receipt of funding for conversion from the Department of Energy (DOE) to final submittal of summary reports to DOE and NRC on the conversion.

PHASE I: PREPARATION FOR CONVERSION

Phase I commenced with receipt of funding for conversion from DOE to cover Phase I only. This funding was considered to be certified per the letter contained in Appendix I of the 1987 proposal; this proposal was submitted to the Department of Energy and official notice of receipt of funding was received with a letter dated November 12, 1987. Because of errors in the contract description provided by DOE, the full approval for receipt of funding was delayed until receipt of the confirming letter dated December 21, 1987. Copies of both letters as well as the 1987 certification letter are enclosed in Appendix I along with documentation showing the extension of the current DOE grant to support Phase I work which has been delayed beyond the original grant period.

Initial efforts in the process to convert the UFTR from use of high enriched to low enriched fuel (HEU-LEU) consisted of preliminary tests and an evaluation to determine whether the SPERT-type fuel available to the R-56 licensee but currently under license SNM-1050 could be qualified for use in the UFTR. Visual and radiographic test results from this work were positive in this regard. Unfortunately, equipment failures and the need to move the SPERT (SNM-1050) fuel storage facility impacted the schedule during the 1988 year so the radiographic tests were not completed until April 1989 along with relicensing the SPERT fuel storage facility. Overall, the results of the radiographic tests of the SPERT fuel were positive showing that the condition of the fuel was such that its integrity was assured. Phase I then continued with activities to justify a fuel selection, either SPERT or silicide, based upon results of prequalification testing of existing SPERT fuel and identifying any modifications in existing reactor systems necessitated by use of the new fuel.

Several previously unconsidered potential complications noted in late 1988 were investigated in 1989. This effort was directed to maintaining and/or improving the UFTR neutronics characteristics while minimizing the overall cost of UFTR conversion. The only two fuels that have been considered are the existing SPERT UO_2, stainless steel clad fuel presently under the SNM-1050 license and the newly developed silicide fuel available through the RERTR program at Argonne National Laboratory.

The first choice had been to use the already existing SPERT fuel for which a number of neutronics and thermal-hydraulics analyses are in existence. This would be the cheaper fuel if acceptable since it is already manufactured. However, even after completion of the prequalification program for the qualification tests used to assure the SPERT fuel can meet UFTR requirements without compromising safety, it was necessary to assure this SPERT fuel could be used without requiring costly modifications which could outweigh the low initial cost of SPERT fuel (no manufacturing costs) and have impact on core neutronics per earlier analyses. The Department of Energy was receptive to this evaluation of the two fuels and work in this area progressed well in 1989. Unfortunately, the complexity and cost of potential structural (the SPERT fuel loading would weigh about 2000 pounds versus the present 50 pound core loading), shielding, fuel arrangement and cooling system changes necessitated by use of the SPERT fuel resulted in a milestone decision in August 1989 not to utilize the SPERT fuel for conversion but rather to utilize the standard plate-type silicide fuel. The anticipated cooling system fuel arrangement and shielding changes potentially necessitated by use of the SPERT fuel were especially strong factors in the decision since space in the UFTR facility is already limited and the facility had been cited for two violations in this area in 1989.

In parallel with selection of the plate-type silicide LEU fuel and identification of necessary reactor systems changes, safety analysis were being performed for the selected LEU fuel conversion and associated system changes. Implementation of the neutronics codes to be used was underway during 1989 and several codes had been implemented and run for test cases. Therefore, UFTR conversion calculations were progressing reasonably well until the loss in August 1989 of the graduate student performing the neutronics calculations as he decided to pursue his advanced degree at another university. Unfortunately, he left with much of his work inadequately undocumented. The unavailability of another qualified student committed to assume this responsibility resulted in further delays. Nevertheless, a student project in Fall 1989 resulted in some progress in assuring neutronics methodology would be adequate though many calculations had to be updated and repeated due to errors in and poor documentation of the previous work. It was hoped that this individual would remain on the project for his thesis work. This retention effort was successful and the neutronics analyses were able to move forward in 1990.

Several errors due to poor documentation necessitated restarting the safety analysis when the student began work on it in early 1990. Although he spent a period at Argonne National Laboratory working with the RERTR group to receive training in the use of the codes, it still required some time for the student to become proficient in use of the codes in-house. Unfortunately several formatting and other flaws in the implemented codes used for the neutronics analysis also slowed progress in 1990. These were cleared up as part of the work on assuring proper code methodology during 1990.

Early in 1991 a student thesis project had resulted in good progress in assuring the neutronics methodology to be adequate and the necessary "benchmark" modeling of the existing core was nearly complete. Only scoping calculations had been completed for the LEU core with the number of fuel plates per bundle not yet set when the 1991 proposal required by 10 CFR 50.64(c)(2) was

submitted. It was expected that DOE-supplied funding support of this work would be extended beyond the April 30, 1991 end date per verbal communications so this work could be concluded along with basic thermal-hydraulic analyses to conclude the required HEU-to-LEU conversion safety analyses. Unfortunately this grant was not officially extended until March 1992. It was also expected that the individual working on this neutronics analysis would complete his thesis work by mid-1991. The "benchmark" static calculations on the existing UFTR HEU core were completed and an internal report generated in April 1991. The individual working on the neutronics analysis completed his thesis work in May 1991 making his defense on May 10, 1991 but continuing his work until May 23, 1991. After the number of fuel plates per bundle was set at 14 from the neutronics analysis, thermal hydraulics analyses were begun in August 1991. These analyses had to be completed before the entire analysis package could be assembled for submission to NRC. A graduate assistant had nearly concluded working on the thermal hydraulics area as the 14-plate fuel bundle arrangement had been selected for the conversion in March 1992. The lack of official grant extension made the financial support of this effort more difficult but a draft report of this thermal hydraulics work was produced in June 1992 with the final report essentially completed during the 1994-95 fiscal year.

A no-cost extension of the Department of Energy Grant DE-FG05-88ER75387 entitled "Conversion of University of Florida Reactor to Low Enriched Uranium (LEU)" was submitted to Ms. Ann Rydalch via a letter dated April 25, 1991 with a copy supplied to Keith Brown. The extension was agreed to be until April 30, 1992. Unfortunately, no further information had been received on the no-cost extension until March 1992 making some plans and efforts difficult to implement. In addition, time consuming efforts were also in progress with the Department of Energy representatives in Idaho to investigate the possibility of replacing the UFTR core fuel boxes

which make reloading and unloading the core difficult and time consuming. DOE representatives even visited the UFTR facility and observed operations as well as reviewed drawings as several days were spent in discussions of how best to proceed in 1992. This unexpected work effort occupied much time and progressed slowly but a decision not to change the fuel boxes was finally reached in summer 1992. Similarly efforts to review fuel drawings and to evaluate the holddown/spreader pin in use in each fuel box had occupied some considerable facility time in the previous year. This latter effort was then essentially complete with the official fuel drawings in draft form from DOE at the UFTR facility and ready to be reviewed when the grant would be officially extended in April 1995.

During the 1994 year, work to incorporate all the analysis completed to date into a single FSAR update to include the Technical Specifications progressed very slowly with some kinetics calculations still remaining in the neutronics area. During that year it was expected that the DOE supplied funding support for this work would again be extended beyond April 30, 1993 with the DOE project manager checking on this per a telephone request made in June 1993. A letter dated August 9, 1993 requesting such an extension was submitted to DOE. In a letter dated November 5, 1993, DOE indicated that the no-cost extension needed to be submitted to the Oak Ridge office; the resubmittal of the extension request to the Oak Ridge Operations Office was accomplished via a letter dated December 15, 1993. During January 1994, the Oak Ridge office indicated that the proper submission really is to the Idaho Operations Office; when informed of this, the project manager was to check, but the grant was not extended as needed until November 1994. This work was expected to be completed by June 1994. However, little work was accomplished as the funding remaining in the grant is for support of a non-permanent employee (student) who was not identified.

In April 1995, DOE officially extended the grant with its remaining support to a March 31, 1996 ending date; since little work was accomplished in this period due to personnel unavailability, the grant was again extended with the understanding that remaining funds could be moved among personnel categories as necessary to allow completion of work through submittal of SAR changes. However, DOE also advised in mid-March 1996 that additional funding for the next phase (Phase II) of the conversion would not be available during fiscal year 1996. The entire package of results was then to be assembled as a Revision to the UFTR Safety Analysis Report by October 1996. With the loss of the permanent Reactor Manager in August 1996, no work was accomplished during the 1996-97 year.

During the 1997-98 year, a visiting professor began assisting with neutronics calculations partially supported by the extended DOE grant which was much delayed. Considerable work remained for verification and conclusion of the analyses. As a result, efforts were again undertaken to extend the existing grant money to March 31, 1999 to allow completion of work through submittal of SAR changes. This renewal, however, was not accomplished so all the money was used up as of March 31, 1998. In addition, DOE again advised in early March 1998 that additional funding for the next phase (Phase II) of the conversion would not be available during fiscal year 1998. Nevertheless, analyses continued throughout the year and were nearing completion as the visiting professor concluded the neutronics analysis prior to his departure in July 1999. Subsequently, a graduate student finished a project in December 2000 to complete remaining kinetics and control blade calculations and organized all the results in the proper format for submittal to NRC.

The plan now is that the entire package of results will be assembled as a Revision to the UFTR Safety Analysis Report with the project expected to progress as indicated in the updated Table II, with a dedicated graduate assistant following up on previous work and assembling the

package. However, DOE has indicated verbally that there is no money available for conversion this year and they are not sure when we will be able to get the LEU fuel made. As negotiations continue with DOE representatives, plans are to submit the package to NRC within one month of DOE indicating availability of support.

As indicated, previous delays have necessitated several extensions in the initial DOE grant which had been received as documented in Appendix I with another extension requested and verbally agreed to, to pick up from April 1993 as indicated above to assure continuous funding throughout the remainder of the conversion process with a new grant to be required for Phase II. In addition to neutronic and thermal-hydraulic analysis, shielding and effluent analyses will be documented to identify any changes in procedures (few expected), security plan, technical specifications or other license documents that must be considered as part of conversion. These should be minimal. This submittal will also contain documentation detailing the various tests and surveillances planned as part of the conversion. At this point a complete set of licensing documents for the conversion will be submitted along with a conversion application for review and approval. This result is now pending DOE support. Assuming resolution of all questions, this submittal will conclude the Phase I licensee efforts. Phase I will then conclude with the issuance by the NRC of the specific Order to Convert.

PHASE II: CONVERSION (Assuming NRC Order to Convert)

Phase II (Conversion) will begin with receipt of the NRC Order directing the conversion and any necessary changes to the license, facility and/or procedures per 10 CFR 50.64(c)(3). This second phase was not yet funded by the existing DOE grant for which an extension has been requested and will include all final tests conducted with the HEU fuel to serve primarily as the basis for later comparison with similar tests with LEU fuel. Phase II will then involve a number of key activities aimed ultimately at having LEU fuel replace HEU fuel at the UFTR facility to include:

1. Shutdown core decay for several weeks followed by core unloading and shipment of irradiated HEU fuel.
2. Verification of qualification of the selected LEU fuel (as applicable).
3. Implementation of required facility changes necessitated for use of LEU fuel; this may involve some changes related to having both HEU and LEU fuel on site simultaneously for a brief time.
4. Receipt of unirradiated LEU fuel.
5. Shipment of irradiated HEU fuel.
6. Documentation of all changes.
7. Completion of all requirements for core loading with LEU fuel followed by loading of the LEU fuel and startup testing to low power.
8. Documentation and record organization for the LEU fuel implementation.

PHASE III: REVIEW AND VERIFICATION OF CONVERSION

Phase III (Review and Verification of Conversion) will consist of a series of activities designed to verify the quality of the conversion process to include both the physical implementation of the LEU fuel and the documentation of the implementation. Activities in Phase III will include:

1. Completion of startup as well as low and full power testing and related surveillances.
2. Verification and evaluation of UFTR operational characteristics.
3. Review of conversion plan and data for consistency.
4. Approval for return of UFTR to normal operations.
5. Return to normal operations.
6. Submission of Final Report to NRC/DOE summarizing HEU operational conditions and comparing these results with the predictions contained in the Safety Analysis submitted to NRC at the end of Phase I and approved as part of the Order to Convert.

SUMMARY CONCLUSIONS

As noted earlier, a relatively detailed list of the various elements that must be obtained, produced or otherwise generated as required throughout the three phases of the UFTR conversion from HEU to LEU fuel is presented in Table I. The current plan continues to be to generate as much of the required safety analysis and design work in-house as possible. Only items such as silicide fuel (now the selected fuel) would be designed and manufactured outside the administrative control of the UFTR licensee. At this point, without having identified all required changes, it is not possible to delineate exactly what other external support may be needed. Neutronics and thermal-hydraulics analyses have been conducted in-house which has necessitated some external support from the RERTR program at Argonne National Laboratory to assure proper code implementation at the

Savannah River site, indicating no HEU fuel will be shipped from the UFTR before the end of 2002 at the earliest. Another conversation with a DOE representative confirmed plans to send the fuel around December 2002 assuming submittal of the relicensing package in July 2002 plus plans to have both sets of fuel on site for a period of time.

Finally, Table II contains an updated tentative schedule (Revision 15) for the major milestone events in the UFTR conversion process commencing with the notification of receipt of funding effective in November 1987 and concluding with submittal of a final report to NRC and DOE summarizing the results of the conversion by July 2005. It should be noted that this schedule is tentative and, as required by 10 CFR 50.64, will be updated yearly. There has been considerable schedule slippage during the past few years. The schedule is also subject to variations caused by availability of replacement fuel or other items involved in required facility changes as well as variations in the level of DOE funding after the first two year period (now extended) for which funding was received. Since DOE is not sure if it will provide new conversion money during fiscal year 2002 or even 2003, this may be a problem. Other areas which may impact the schedule are the availability of a shipping cask especially for irradiated HEU fuel (we are currently using our HEU fuel at a rate of about 1–1.5 MW-Days energy generation per year so it will almost certainly require a fuel cask versus a 6M container though this may depend on the cooling period) and final usage of the UFTR with HEU fuel to provide a basis for comparison of changes in operating characteristics or to meet education, research and service commitments. Within these constraints and conditions, the schedule in Table II is one which the licensee is committed to meeting and which the licensee considers relatively realistic based upon expected resources and recent progress with neutronics calculations.

Although much of the detail of the conversion process has depended upon the final selection of fuel types, this selection is now finalized; therefore, the information, especially the tentative schedule in Table II provided in this updated proposal, shows that the LEU conversion at the UFTR has progressed up until this past year with significant delays occurring over the years again due to delays in getting the extension to the DOE grant to document completion of the thermal hydraulics calculations and to work with the Department of Energy on fuel review and checks for insertion into the core. As previously indicated, we lost the individual working on the submittal package seven years ago. At this point, reactor staff including the Director have essentially completed the package with graduate assistant support and using work produced by visiting professor support and a graduate student during 1998-00. The key decisions remaining will involve identification and evaluation of system changes required by the conversion, especially concerning utilization of the existing fuel boxes, shipment of used fuel and delivery of new fuel as well as development and implementation of a test program for both the HEU and LEU cores some of this uncertainty is also involved with the possibility of DOE replacement of UFTR fuel boxes. The schedule will likely be most impacted, however, in the near future by the times required for manufacture of the LEU fuel and allocation of DOE support. The schedule presented in Table II is considered to be realistic and should be attainable now that the calculations are complete for both the HEU and LEU core and thermal hydraulics calculations are also complete except for several relatively minor documentation points. All analyses including confirmatory calculations show the 14-plate LEU fuel bundle is acceptable for the conversion. As a result we should be able to conclude in two additional months after DOE indicates they can supply fuel making the proposed schedule for first submittal realistic depending on DOE financial support and availability.

The final drawback may be DOE funding available for the conversion. Appendix I contains the original letters of notification that federal government funding for UFTR conversion was available and had been received from the Department of Energy as well as the extension letter for support through March 1997 plus later letters indicating funding for conversion would not be available during fiscal year 1998 and 1999. It should be noted that DOE indicated that funding for conversion would also not be available during fiscal year 2001; lately, DOE has indicated they are not sure if they will be able to supply fuel for UFTR conversion in fiscal year 2002 or even 2003 as they are having internal discussions on this matter and will wait to determine whether the UFTR submits its relicensing package for its R-56 license which runs out on August 30, 2002.

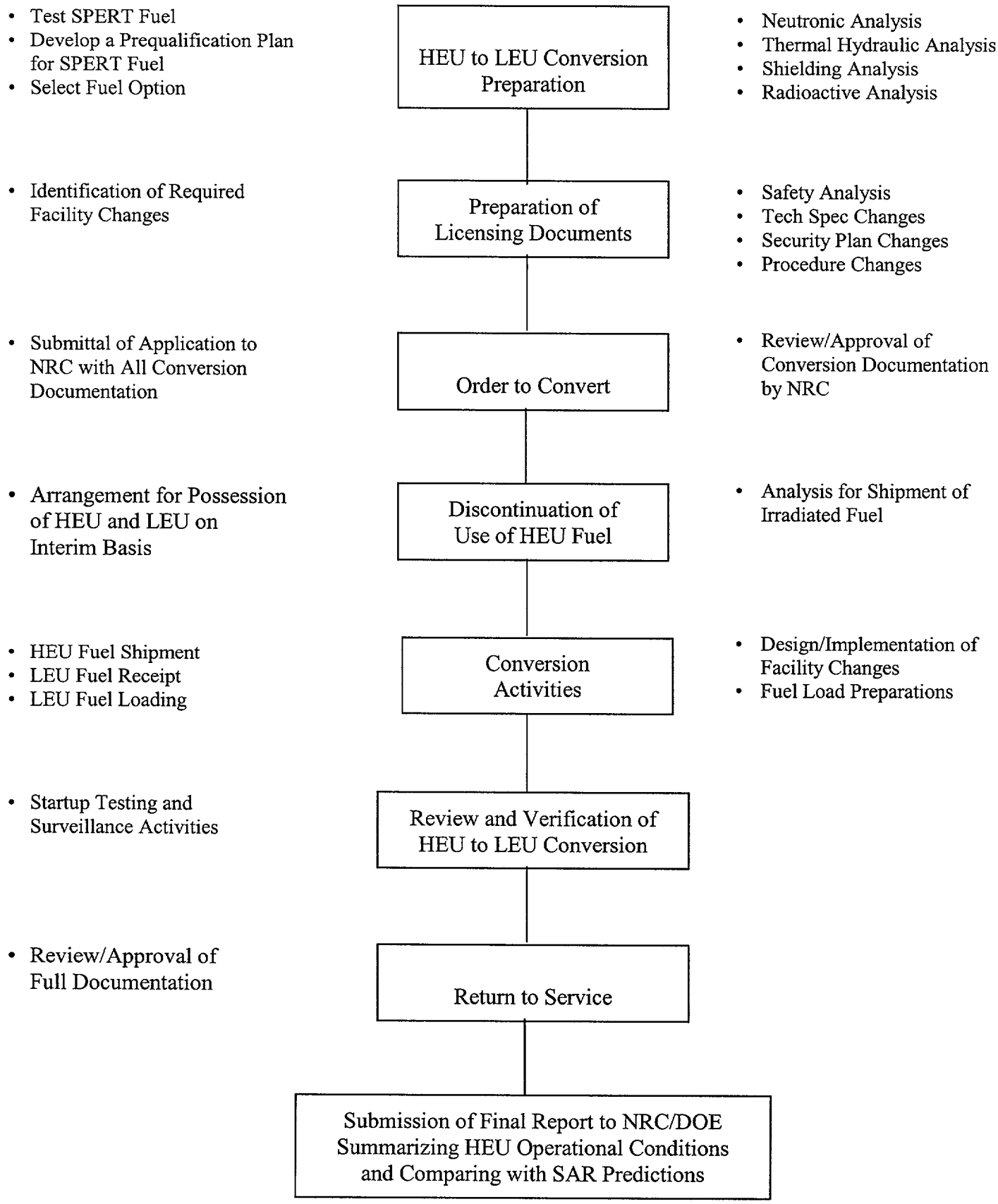

Figure 1. University of Florida Training Reactor HEU to LEU Conversion Flow Diagram

TABLE I

University of Florida Training Reactor
Key Activities for HEU-to-LEU Fuel Conversion

I. PHASE I - PREPARATION FOR CONVERSION

A. Receipt of Funding from Department of Energy

B. Analysis of UFTR-Specific LEU Conversion Options

1. Pretesting of Selected SPERT Fuel Pins
2. Development of a Qualification Program for SPERT Fuel Pins
3. Completion of Prequalification Testing of SPERT Fuel
4. Evaluation of Comparative Conversion Options (SPERT Vs. Silicide)
5. Selection of LEU Fuel Option for UFTR Conversion

C. Safety Analysis/Licensing Studies

1. Neutronic Analysis of LEU-Fueled UFTR
2. Thermal-Hydraulic Analysis for LEU-Fueled UFTR
3. Shielding Analysis for LEU-Fueled UFTR
4. Radioactive Effluent Analysis as Required

D. Identification of Changes in the R-56 License, Technical Specifications, Facility, Security Documents and Procedures Under the Scope of 10 CFR 60.64(c)(3) as Necessitated by Fuel Conversion

E. Preparation of Full Submittal to NRC to Support Conversion Including all Supporting Documents

II. PHASE II - CONVERSION

A. NRC Order to Convert

B. Fuel-Related Activities

1. Qualification of Selected LEU Fuel
2. Final UFTR Operations with HEU Fuel
3. Shipment of Irradiated Fuel
4. Receipt of LEU Fuel

C. Implementation of Required Changes in R-56 License per Item ID.

D. LEU Fuel Loading Activities

1. Completion of Preparations for Core Load
2. Loading of LEU Fuel
3. Startup Testing and Surveillance

E. Completion of Startup Documentation

III. PHASE III - REVIEW AND VERIFICATION OF CONVERSION

A. Completion of Startup Testing and Related Surveillances
B. Completion of Power Testing and Surveillances
C. Determination of UFTR Operational Characteristics
D. Return to Normal Operations
E. Submission of Final Conversion Report to NRC/DOE

TABLE II

(Revision 16)

University of Florida Training Reactor
Tentative Milestone Schedule
for HEU-to-LEU Fuel Conversion

I. Effective Date of Receipt of Funding ..... November 1987

II. Date of Full Submittal to NRC of Application to Convert (including all necessary documents) *(tentative)* ..... May 2002

III. Date of NRC Order to Convert ..... January 2004

A. Date of Completion of All Plans to Convert ..... June 2004

B. Date of Receipt of LEU Fuel ..... September 2004

C. Date of Completion of Any Final Tests with HEU Fuel ..... December 2004

D. Date of Removal of HEU Fuel ..... January 2005

E. Date of Shipment of HEU Fuel ..... March 2005

F. Date of Loading of LEU Fuel ..... April 2005

G. Date of Completion of Determination of Initial Operational Parameters with LEU (Startup and Power Operations Testing) ..... May 2005

H. Date of Submittal of Report to NRC/DOE Summarizing New Operational Characteristics and Comparing with Predictions of Safety Analysis ..... July 2005

3/02

APPENDIX I

ORIGINAL LETTERS OF NOTIFICATION THAT FEDERAL GOVERNMENT FUNDING FOR UFTR CONVERSION WAS AVAILABLE AND HAD BEEN RECEIVED FROM THE DEPARTMENT OF ENERGY

AS WELL AS THE EXTENSION LETTER FOR SUPPORT THROUGH MARCH 1997

PLUS THE LETTERS INDICATING FUNDING FOR CONVERSION WOULD NOT BE AVAILABLE DURING FISCAL YEARS 1998 AND 1999 WITH FOOTNOTE DOCUMENTING UNAVAILABILITY OF FUNDING FOR CONVERSION DURING FISCAL YEAR 2001 AND PERHAPS 2002 OR LATER

U.S. DEPARTMENT OF ENERGY
NOTICE OF FINANCIAL ASSISTANCE AWARD

The authority of Public Law 95-91 DEPARTMENT OF ENERGY ORGANIZATIONAL ACT and

subject to legislation, regulations and policies applicable to (cite legislative program title):
CONVERSION OF UNIVERSITY REACTOR

PROJECT TITLE FUEL CONVERSION	2. INSTRUMENT TYPE X GRANT COOPERATIVE AGREEMENT
RECIPIENT (Name, address, zip code, area code & telephone no.) UNIVERSITY OF FLORIDA GRINTER HALL GAINESVILLE, FLORIDA 32611	4. INSTRUMENT NO. DE-FG07-88ER75387 5. AMENDMENT NO. M006 6. BUDGET PERIOD FROM: 11/15/89 THRU: 04/30/92 7. PROJECT PERIOD FROM: 11/15/87 THRU: 04/30/92
RECIPIENT PROJECT DIRECTOR (Name and telephone No.) WILLIAM G. VERNETSON (904) 392-1408 RECIPIENT BUSINESS OFFICER (Name and telephone No.) RICHARD C. MARSHALL (904) 392-1582	10. TYPE OF AWARD NEW CONTINUATION RENEWAL X REVISION SUPPLEMENT
DOE PROJECT OFFICER (Name, address, zip code, telephone No.) (TO BE ASSIGNED) U.S. DEPARTMENT OF ENERGY CHICAGO FIELD OFFICE 9800 SOUTH CASS AVENUE ARGONNE, ILLINOIS 60439	12. ADMINISTERED FOR DOE BY (Name, address, zip, telephone No.) (TO BE ASSIGNED) U.S. DEPARTMENT OF ENERGY CHICAGO FIELD OFFICE 9800 SOUTH CASS AVENUE ARGONNE, ILLINOIS 60439

RECIPIENT TYPE

STATE GOV'T	INDIAN TRIBAL GOV'T	HOSPITAL	FOR PROFIT ORGANIZATION C P SP	INDIVIDUAL
LOCAL GOV'T	X INSTITUTION OF HIGHER EDUCATION	OTHER NONPROFIT ORGANIZATION		OTHER (Specify)

ACCOUNTING AND APPROPRIATIONS DATA

a. Appropriation Symbol	b. B & R Number	c. FT/APP/OC	d. CFA Number
N/A	N/A	N/A	N/A

15. EMPLOYER I.D. NUMBER/SSN
87081002

BUDGET AND FUNDING INFORMATION

a. CURRENT BUDGET PERIOD INFORMATION		b. CUMULATIVE DOE OBLIGATIONS	
DOE Funds Obligated This Action	$ 0	(1) This Budget Period [Total of lines a.(1) and a.(3)]	$ 0
DOE Funds Authorized for Carry Over	$ 0	(2) Prior Budget Periods	$ 169431
DOE Funds Previously Obligated in this Budget Period	$ 85957		
DOE Share of Total Approved Budget	$ 85957		
Recipient Share of Total Approved Budget	$ 0	(3) Project Period to Date [Total of lines b.(1) and b.(2)]	$ 169431
Total Approved Budget	$ 85957		

TOTAL ESTIMATED COST OF PROJECT $ 169431
is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.

AWARD/AGREEMENT TERMS AND CONDITIONS
This award/agreement consists of this form plus the following:
1. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement) (Date) / /
2. Applicable program regulations (specify) N/A
3. DOE Assistance Regulations, 10 CFR Part 600, as amended, Subparts A and X B(Grants) or C(Cooperative Agreements)
4. Application/proposal dated November 17, 1989, X as submitted with changes as negotiated

REMARKS
THE PURPOSE OF THIS AMENDMENT IS TO TRANSFER THIS GRANT FROM THE U.S. DEPT. OF ENERGY, IDAHO FIELD OFFICE, IDAHO FALLS, IDAHO, TO THE U.S. DEPT. OF ENERGY, CHICAGO FIELD OFFICE, ARGONNE, ILLINOIS. THE EFFECTIVE DATE OF TRANSFER IS 2/29/92.

EVIDENCE OF RECIPIENT ACCEPTANCE (Signature of Authorized Recipient Official) (Date) (Name) (Title)	21. AWARDED BY Virginia L. Sandwina 2-25-92 (Signature) (Date) VIRGINIA L. SANDWINA (Name) CONTRACTING OFFICER (Title)

EFO

UNIVERSITY OF FLORIDA
OFFICIAL AWARD ACCEPTANCE

DATE PRINTED: 12/21/89

NOTIFICATION OF ACCEPTANCE (NOA) FOR THE PRESIDENT OF THE UNIVERSITY OF FLORIDA, ACTING ON BEHALF OF THE BOARD OF REGENTS

QUESTIONS - PLEASE CONTACT THE UF DIVISION OF SPONSORED RESEARCH, AWARD ADMINISTRATION, 205 GRINTER HALL, 392-1582

TITLE: PROPOSAL FOR GOV'T SUPPORT TO COVER COST OF UFTR CONVERSION FROM HEU TO LEU FUEL

ADMINISTRATIVE DATA

UPN#: 87081002 RELATED UPN#:
AGENCY: U S DEPT OF ENERGY (E048)
DIVISION:
AGENCY NO: DE-FG05-88ER75387
TYPE: __ NEW (N) __ CONTINUATION (C) __ RENEWAL (R) __ SUPPLEMENTAL (S) X EXTENSION __ REVISED
CATEGORY: X RESEARCH (R) __ TRAINING (T) __ OTHER (O)
PROGRAM: __ CONTRACT (C) __ PUR. ORDER (P) __ COOP. AGREE (A) __ SPA (S) __ MEMO OF UND (M) X GRANT (G)
TEMP: __ GUARANTEED BY:
PERM: __ SUPERSEDES:
BUDG BEG: 11/15/87 BUDG END: 04/30/91
PROJ BEG: 11/15/87 PROJ END: 04/30/91
PROJECT PERIOD #: 87081002
FUNDS RESTRICTED X YES __ NO
HISTORY UPN#: 87081002 FLA DEMO PROJ: N

AWARD DATE: 01/05/88
P.I.: VERNETSON W G
SSN: 216-44-0124
COLL: EIES - ENGINEERING (45
DEPT: NUCLEAR ENGINEERING SCIENCES (NES
CO-PI:
SSN: - -
COLL: (
DEPT: (
HEGIS #: 210920
HUMAN SUBJECTS APPROVAL #:
HS APPROVAL EXPIRES:
LAB ANIMAL APPROVAL #:
RECOMBINANT DNA/RNA: BIOHAZARDS:
PROPRIETARY/CONFIDENTIAL:
SUBCONTRACTOR: UF:
PRIME NAME:
NO:
__ OTHER:
:

COST DATA

APPLICABLE INDIRECT COST WILL ACCRUE TO THE UNIT(S) AS SPECIFIED ON PROPOSAL.

DUAL INVOLVEMENT: IDC RETURN CODE: Y

ON-CAMPUS
ACCOUNT NO: 450812612
DIRECT AMOUNT: $ NO COST EXT
INDIRECT AMOUNT: $ -0-
RATE 45.00 BASE MTD
TOTAL AMOUNT: $ NO COST EXT
COST SHARING REQUIRED: $

OFF-CAMPUS
ACCOUNT NO:
DIRECT AMOUNT: $
INDIRECT AMOUNT: $
RATE BASE
TOTAL AMOUNT: $
COST SHARING REQUIRED: $

TOTAL FUNDING OF THIS AWARD: $ NO COST EXT
TOTAL COST SHARING OF THIS AWARD: $
UNRECOVERED INDIRECT COST: $
CUMULATIVE PROJECT FUNDING: $ 169,431.00
CFDA #:

REMARKS

DEPT CONTACT: EIES
ADDRESS:

Dillard C. Marshall
AUTHORIZED UNIVERSITY ACCEPTANCE SIGNATURE
DIVISION OF SPONSORED RESEARCH
NAME: DILLARD C. MARSHALL
TITLE: ASSISTANT DIRECTOR OF RESEARCH

DSR-6 (8/88) Processed By: MWR

ORIGINAL: ACC OFF __ GREEN: DATA ENTRY __ PINK: FILE __ YELLOW: COLL/DEPT __ GOLD: PI __ BLUE: ACCT. NO. __

Department of Energy
Oak Ridge Operations
Post Office Box E
Oak Ridge, Tennessee 37831

205 NOV 17 1987
MR

November 12, 1987

Mr. Dillard C. Marshall
Assistant Director
Office of Research Administration
University of Florida
Gainesville, FL 32611

Dear Mr. Marshall:

GRANT NO. DE-FG05-88ER75387 - AMENDMENT NO. A000

Enclosed are two copies of the subject grant document which have been signed on behalf of the Department of Energy.

If this document is satisfactory, please have the two enclosed copies signed by the proper official on behalf of your organization and return one fully executed copy to this office. The remaining fully executed copy is for your retention.

In addition, please have executed the enclosed Assurance of Compliance - Nondiscrimination in Federally Assisted Programs, and return the signed original to this office together with the executed copy of the grant and a completed Form DOE-538, Notice of Energy RD&D Project. Please return two copies of the DOE-538.

Sincerely,

Charles D. Crowe
Contracting Officer
Contract Management Branch
Procurement & Contracts Division

AD-423:Lyle

Enclosures:
1. Grant (2 cys.)
2. Assurance of Compliance
3. DOE 538 (3 cys)

Celebrating the U.S. Constitution Bicentennial — 1787-1987

Department of Energy
Oak Ridge Operations
Post Office Box E
Oak Ridge, Tennessee 37831

RECEIVED DEC 29 1987

December 21, 1987

Dr. William G. Vernetson
Director of Nuclear Facilities
College of Engineering
University of Florida
Gainesville, FL 32611

Dear Dr. Vernetson:

GRANT NO. DE-FG05-88ER75387 (REVISED PROJECT DESCRIPTION)

In response to telephone conversations with you and with Keith Brown at Argonne, enclosed is a revised project description for your grant from the Department of Energy to cover cost of the conversion from HEU to LEU fuel in University of Florida's training reactor. I apologize for the confusion and delay in this revision reaching you.

Please substitute the attached Part II, Project Description and Reporting Requirements, for the one transmitted to Dillard Marshall on November 12, 1987, and have Mr. Marshall sign the award and return an original to us as soon as possible. You will not be able to draw down any money from Letter of Credit on this award until the original copy is returned to us.

Thank you for calling our attention to the fact that your award is different from the other reactor fuel conversion awards the Department of Energy has.

Sincerely,

Martha A. Lyle

Martha A. Lyle
Contract Specialist
Contract Management Branch
Procurement and Contracts Division

AD-423:Lyle

Enclosure:
Part II of Grant DE-FG05-88ER75387

cc: Dillard C. Marshall, Asst. Dir.
Research Administration
University of Florida
223 Grinter Hall
Gainesville, FL 32611

Celebrating the U.S. Constitution Bicentennial — 1787-1987

Department of Energy
Idaho Operations Office
785 DOE Place
Idaho Falls, Idaho 83402

205 DEC 20 '89
MR

December 19, 1989

Mr. Dillard C. Marshall
University of Florida
223 Grinter Hall
Gainesville, Florida 36211

SUBJECT: Grant No. DE-FG07-88ER75387

Dear Mr. Marshall:

We are enclosing three copies of the subject grant which have been signed on behalf of DOE. Please have all three copies signed by an authorized official and return two fully executed copies to this office within two weeks from the date of this letter. The third fully executed copy is for your retention.

Should you have any questions, please contact Ann Rydalch on (208) 526-9617.

Sincerely,

Trudy A. Thorne

Trudy A. Thorne
Contract Specialist
Financial Assistance Branch

Enclosure

Department of Energy
Germantown, MD 20874-1290

February 23, 1998

Dr. William G. Vernetson
University of Florida
202 Nuclear Sciences Center
Gainesville, Florida 32611-8300

Dear Dr. Vernetson:

In accordance with 10 CFR Part 50.64, "Limitations on the Use of Highly Enriched Uranium in Domestic Non-Power Reactors," you are hereby notified that Federal funding for conversion of your reactor to low enrichment uranium fuel will not be available during Fiscal Year 1998.

You will be notified in the event these circumstances change.

Sincerely,

John Gutteridge, Program Director
Office of Planning and Analysis
Office of Nuclear Energy,
Science and Technology

Printed with soy ink on recycled paper

Department of Energy
Germantown, MD 20874-1290

April 7, 1999

RECEIVED APR 1 2 1999

Dr. William G. Vernetson
University of Florida
202 Nuclear Sciences Center
Gainesville, Florida 32611-8300

Dear Dr. Vernetson:

In accordance with 10 CFR Part 50.64, "Limitations on the Use of Highly Enriched Uranium in Domestic Non-Power Reactors," you are hereby notified that Federal funding for conversion of your reactor to low enrichment uranium fuel will not be available during Fiscal Year 1999.

You will be notified in the event these circumstances change.

Sincerely,

John Gutteridge, Program Director
University Programs
Office of Nuclear Energy,
Science and Technology

DISCUSSIONS WITH REPRESENTATIVES OF DOE INDICATED FUNDING FOR CONVERSION WOULD NOT BE AVAILABLE IN FISCAL YEAR 2001 AND PERHAPS NOT UNTIL LATE IN 2002 OR LATER, THOUGH NO DOCUMENTING LETTER HAS BEEN RECEIVED AS OF DATE OF THIS PROPOSAL.

Printed with soy ink on recycled paper