Brookhaven National Laboratory

Laboratory Royalty Use Program Annual Report to the Department of Energy

This report is limited to FY 1998 activities of the
Royalty Use Program that were funded by
Royalty income from prior fiscal years

**BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES
UPTON, NEW YORK 11973-5000
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UNITED STATES DEPARTMENT OF ENERGY**

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Acknowledgments

The Laboratory Royalty Use Program is directed by John Marburger, Laboratory Director and is administered by Gregory J. Ogeka, Interim Assistant Laboratory Director for Finance and Administration (ALDFA). Preparation of the Fiscal Year 1998 report was coordinated and edited by Gregory J. Ogeka and Kevin J. Fox, Interim Special Assistants to the ALDFA. A special thank you is extended to the Photography and Graphic Arts Group for their help in publishing. Of course, a very special acknowledgment is extended to all of the authors of the project annual reports and to their secretaries. The FY 1999 Report will be prepared and submitted by the Associate Laboratory Director for Applied Science and Technology.

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Introduction

Background: Brookhaven National Laboratory was established in 1947 on the site of the former Army Camp Upton. Brookhaven is a multidisciplinary Laboratory that carries out basic and applied research in the physical, biomedical and environmental sciences, and in selected energy technologies. Associated Universities, Inc. managed the Laboratory, under contract with the U. S. Department of Energy until April 30, 1998. On March 1, 1998, Brookhaven Science Associates LLC (BSA) was awarded a contract by the U. S. Department of Energy to manage the Laboratory. Brookhaven Science Associates has taken responsibility for all aspects of the existing Royalty Use Program from the prior contractor, AUI. **This report is limited to FY 1998 activities of the Royalty Use Program that were funded by royalty income from prior fiscal years.** Any FY 1998 royalty income allocated in FY 1998 shall be reported in the FY 1999 Royalty Use Program Report.

BNL's annual budget has averaged about \$380 million, and its facilities are valued at over \$2.2 billion. There are approximately 3,050 employees, and another 4,600 guest scientists and students who come each year to use the Laboratory's facilities and work with its staff.

Laboratory Major Core Competencies: The Laboratory has four major competencies, which complement the overall mission and objectives of the DOE and BNL.

Research Facilities: Conceive, design, construct, and operate complex, leading edge, user-oriented facilities in a safe and environmentally benign manner that is responsive to the DOE, and the needs of the users.

Scientific Research: Carry out basic and applied research in long-term programs at the frontier of science that supports DOE missions and the needs of the Laboratory's users community.

Technology Development: Develop advanced technologies that address national needs and initiate their transfer to other organizations and to the commercial sector.

Knowledge Transfer: Disseminate technical knowledge to educate new generations of scientists and engineers, to maintain technical currency in the nation's workforce, and to encourage scientific awareness in the general public.

Royalty Use Program Objectives: The objectives for the Program have remained basically unchanged from the prior Contractor. The program objectives are to provide opportunities for education and training, increased scientific interaction both internally and externally, and technology transfer, as well as stimulating new initiatives and research partnerships. These objectives are key elements of the Laboratory's mission. Inventions made at the Laboratory have the potential to generate additional net revenues. Therefore, it is appropriate to use these funds in support of the foregoing endeavors, as well as to assist in maintaining the scientific excellence and the overall vitality of the Laboratory. Further, the use of these funds is also a means to stimulate and challenge BNL's staff and to obtain support for new initiatives in a relatively short time.

Program Core Categories: Activities funded by the Royalty Use Program fall into the following five (5) broad categories.

Education and Training Activities: Support training and educational activities for postdoctoral research associates, Ph.D. and Masters Degree students, and undergraduate and high school students and teachers. This category includes salary support and stipends for BNL staff, as well as necessary materials and supplies.

Cooperative Ventures: Support joint efforts with universities to recruit graduate students who will receive their training at BNL.

Technology Transfer Activities: Support joint efforts on existing and new initiatives with industry, universities, not for profits, and/or other government agencies, including activities that increase the licensing potential of existing or new inventions at BNL.

New R&D Initiatives: Support appropriate research and development activities similar to the Laboratory Directed Research and Development Program, as well as to stimulate other new initiatives and research partnerships. These latter cases often require monies that are not readily available, or not in the time frame required. This category allows support for these efforts or to take advantage of research support in those cases where it is necessary to match funds from industry, universities, not for profits, and/or other government agencies.

Other Laboratory Director Discretionary Programs: Support travel costs and honoraria for outside speakers to participate in seminars and workshops dedicated to generating new ideas or concepts. Funds can also be used to purchase items and services not directly related to a specific scientific program, such as scientific books and journals.

Management Process

Prime Contract Requirements: Articles 99, Patent Rights – Nonprofit Management and Operating Contractors (Modified); and 102, Technology Transfer Mission; of the Prime Contract between the United States Department of Energy (DOE) and Brookhaven Science Associates LLC (BSA) for the operation of Brookhaven National Laboratory (BNL) requires BSA to use the balance of any royalties or income earned and retained by it during any fiscal year, from subject inventions under the Prime Contract, for scientific research, development and education purposes consistent with the research and development mission and objectives of the Laboratory. This includes activities which increase the licensing potential of other inventions.

Paragraph (k)(3) of Article 99 also established a five percent limit (of the BNL budget) for such use of royalty funds. That is, if the retained balance exceeds 5% of the annual BNL budget, 75% of the excess above the limit is paid to the U.S. Treasury, with the remaining 25% to be used for the purposes described above.

Finally, paragraph (h)(2) of Article 102 requires an auditable plan, subject to the Contracting Officer's approval, which sets forth those uses to which the funds will be applied at the facility, and, at year end, also provides a separate accounting to the DOE of how those funds were actually used. DOE, in turn, will evaluate the use of the funds as part of the annual appraisal process.

Program Guidelines: Brookhaven National Laboratory's "Guidelines and Procedures for Developing Requests via the Laboratory Royalty Use Program," sets forth overall Laboratory Policies and Procedures for the conduct of this program. Distributed to all Departments and Divisions, it highlights that the allocation of resources and the coordination, review, and selection are the responsibility of the Laboratory Director. These guidelines were developed under the prior Contractor, AUI, and were utilized for selection and administration of the FY 1998 program. For FY 1999, new guidelines were issued under Brookhaven National Laboratory's Standard Practice Instruction, NO. 6-08 effective 10/01/98.

Restrictions: Royalty funds can only be used for scientific research, development and educational purposes consistent with the research and development mission and objectives of BNL and only for allowable expenditures as defined by BSA's Prime Contract with the DOE for the operation of BNL (Article 32, Allowable Costs and Fixed Fee [June 97]). Funds cannot be used to substitute for, or augment any tasks for which a specific limitation has been placed by Congress or the DOE or for any specific tasks that are funded by DOE or other users of the Laboratory. The funds cannot be used for the acquisition of permanent staff. Royalty use programs are limited to a three-year period. Any funds not spent within the three-year period automatically revert back to the Laboratory Director.

Procedure: The total amount of funds available for the program, and accordingly the number of activities supported, vary from year to year, dependent to a large extent on the balance of any royalty income earned and retained by BSA from inventions under its Prime Contract with the DOE for the operation of BNL.

To the extent funds are made available by BSA from royalty income earned, the Laboratory Director determines the amount of funds to be allocated to an organizational unit. In determining funding allocations, significant consideration is given to the amount of royalty income generated by a particular organizational unit as well as previously distributed royalty funds to that organizational unit. Once funding allocations have been determined, the steps for the preparation, submission and approval of requests are as follows:

- Organizational units are notified of the amount of royalty funds made available to them. Each is then advised to submit a request(s) for the use of such funds, broken down by the aforementioned broad categories.
- Requests consist of a Proposal Information Questionnaire (PIQ) (see Appendix A) outlining the planned use of funds. Applicants are encouraged to be brief but to provide sufficient information on the purpose and method of accomplishment. The questionnaire must be completed by the initiator and approved by the appropriate Department Chairperson or Division Head, Department/Division Administrator, and the cognizant Associate Director. If the proposed activity impacts an individual's program or work, plans to assure the satisfactory continuation of the individual's regularly funded programs or work must be approved by the Department Chairperson or Division Head and the Director.
- In reviewing submissions, the Director gives consideration to the merit of each request, excellence of concept, innovativeness, compliance with one of the previously mentioned broad categories, relevance to the Laboratory's research and development mission and objectives of the facility, as well as the potential for future generation of revenues and impact on the scientific community, BNL, universities, industry, and the DOE.
- All requests (PIQs) are submitted to the Assistant Laboratory Director for Finance and Administration (ALDFA) for coordination. The ALDFA performs an initial screening to assure compliance with these guidelines and procedures and obtains any additional information deemed necessary.
- The Laboratory Director reviews all requests and approves those activities or items to be funded.
- When a specific request is authorized, the Chairperson will be notified, as well as the ALDFA. A separate BSA account is established by the ALDFA to budget and collect the costs for the specific activity.

Reporting Requirements: An annual report is required for each activity supported and must be submitted by October 31 to the ALDFA. This report provides a description of the activities supported by each of the broad categories previously indicated, along with associated dollars, as well as a description of any significant accomplishment, event, etc. The ALDFA provides BSA and the DOE with an annual accounting of how the funds were used. In addition, the ALDFA reviews reports for each activity to assure compliance with the guidelines and procedures. It should be noted that the FY 1998 Royalty Use Annual Report only includes the project reports from FY 1998 that were funded

by income from prior fiscal years. Any activities performed in FY 1998 and funded by FY 1998 income shall be reported in the FY 1999 Royalty Use Program Annual Report. The FY 1999 Report will be prepared and submitted by the Associate Laboratory Director for Applied Science and Technology.

FY 1998 Royalty Use Program

General: The Laboratory's Royalty Use Program, as covered in this report, first began in FY 1994. The results of the FY 1994 through FY 1997 effort were reported in the two Royalty Use Program Reports dated December 1995 and February 1998.

In FY 1998, Associated Universities, Inc. authorized the Laboratory \$750,750 for the Royalty Use Program. These funds were from fiscal years prior to FY 1998. Brookhaven Science Associates accepted responsibility for the program on March 1, 1998. This amount authorized represents less than 0.1% of the estimated total Laboratory budget in FY 1998 and is well below the five percent (5%) ceiling referenced in Article 99, paragraph (k)(3).

The FY 1998 allocation of Royalty Use funds from prior years income was distributed to the Biology Department with approval of the Laboratory Director. If distributions were made to more than one Department or Division, then a predetermined formula is used to determine distribution among them. The formula takes into account the total profits and distributions for all years and previous distributions for an invention. This gives each invention its fair share of the profits, but allows withholding small sums for which the required paperwork and review process would make it unreasonable to distribute that year.

The following is a summary of prior FY 1998 income that was allocated and spent in FY 1998 by Department.

Summary of FY 1998 Royalty Use Program Funding

Department	FY 1998 Authorized New Funds	FY 1998 Funds Spent	Carryover Funds Spent	Carryforward Funds
Biology	\$750,750	\$487,305	\$10,252	\$263,445
Medical	\$0	\$0	\$0	\$0
Applied Science	\$0	\$0	\$0	\$0
Instrumentation	\$0	\$0	\$0	\$0

Success Indicators: Considering BNL's Royalty Use Program only began in late FY 1994, it has been very successful. Some of the more common indicators/ measures of success highlighted in the following "Annual Reports of Projects" are:

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
Number of Post-Doctoral Students Supported	6		
Number of Graduate Students Supported	2	1	
Number of Students supported under the Science of Engineering Research Semester and the Summer Student Programs	2		
Number of Seminars/workshops	22	4	
Number of Scientific Research Programs Funded	4	1	1

Annual Reports of Projects: The following is the annual report from the one project funded.

Biology Department - FY 1998

In FY 1998, the Biology Department spent \$497,557 to support a new R&D initiative entitled, "Design and Development of the New Generation Protein Data Bank (PDB) System." Work was performed under the Biology Department Royalty Account 09110. These funds were from royalty income generated in fiscal years prior to FY 1998.

Introduction

The Protein Data Bank is an archive of experimentally determined three-dimensional structures of biology macromolecules which serves a global community of researchers, educators, and students. It is a major resource of research in a wide variety of areas including structural biology, studies that lead to deeper understanding of the molecular basis of diseases, and the design of new therapeutics. In order to meet the growing demands of the scientific community for access to this information, it is crucial for the PDB to upgrade its existing information infrastructure to current state of the art.

Summary

The principal aim of the Project is to redefine the information system of the Protein Data Bank (PDB), remodel and re-engineer its operation, and develop a functional prototype which could be, after necessary evaluation, quickly deployed into full production-level operation.

In FY 1998 we substantially improved the overall computing infrastructure at the PDB and we developed several crucial components of the new system. Most notably, we defined a formal comprehensive grammar for the PDB entries, together with a set of constraints for their validation, and a set of rules for transformations between the PDB and mmCIF formats (the latter has become a new international standard for the representation of macromolecular structure data).

In collaboration with SoftDeC, Ltd., we developed GLASS software to automate the process of parsing, validation, and transformation of structured documents, such as the PDB entry, given a set of high-level declarative specifications of the grammar, constraints, and transformation rules. Furthermore, the specifications (meta-data) and parsed documents (proper data) can be managed in a relational database using a standard SQL interface. This will significantly contribute to higher accuracy and lower costs of further system evolution and maintenance.

Working tightly together with the PDB staff and external collaborators, we further contributed to the development of the 3DB-base, an object-relational database for PDB, and to the development and/or improvement of PDB user interfaces, such as the introduction of the layered-protocol to AutoDep, development of PDB Lite, and an XML viewer of PDB/mmCIF documents.

1. Design and development of the GLASS technology

In collaboration with SoftDeC, we designed and developed powerful technology for specification and processing of structured documents - GLASS.

GLASS stands for Grammatical, Logical, and Algebraical System Specification. GLASS is a formal model of structured data, where the structure and allowable values are defined by a declarative context-free grammar with an optional set of logical and algebraic constraints. A GLASS grammar also can include structured annotation of itself, and rewrite rules for transforming documents into other form or language.

We designed a set of software tools to implement the model, and to enable various operations on structured documents.

GLASS tools operate on two types of files: annotated grammars and document instances. A valid grammar G specifies a language L , which is a set of all recognized instances (by that grammar). GLASS grammars are constrained context-free grammars. We say that a document D is an instance of the language $L(G)$, if, and only if, D is structured according to the grammar G . The latter statement is semantically equivalent to saying that D can be parsed, generated, or validated using G .

A GLASS grammar is a tuple $G = \langle P, A, C, T, E \rangle$, where

- P is a set of Production rules (in the Extended Backus-Naur Form),
- A is the Annotation graph,
- C is a set of value Constraints, which are logical and algebraic expressions on values, referenced by the non-terminal symbols of the P rules,
- T is a set of Transformation rules, which are conditional transforms from the set of values associated with names of symbols from P after successful parsing, and
- E is the set of External methods and protocols, which are used by constraints in C and/or rules in T (and possibly also by the productions in P as parsing constraints).

The meaning of such a grammar is as follows:

- (i) As an analytical grammar, $G = \langle P, A, C, T, E \rangle$ defines a language $\{D \mid D \text{ in } L(G)\}$, where D can be parsed according to the production rules of P , and the parsed values (substrings of D) satisfy all the constraints of P and C .
- (ii) As a generative grammar, G defines two languages. The first one is $L(G)$, i.e. all documents parseable by G . The second language is $T(L(G))$, i.e., all results of applying the transforms from T on documents parsed by P and validated by C .

The following three use-scenarios exemplify the functionality and applicability of the GLASS toolkit.

Scenario 1 - Grammar-Directed Validation

GLASS can check an arbitrary document D against any grammar G . The answer is YES, if D is in $L(G)$, or NO otherwise, accompanied by more detailed messages on why not. There is no other output. For example, using a grammar G_{pdb} for PDB-formatted documents, one can check

whether or not PDB entries are properly syntactically formed, and whether or not they satisfy all given value constraints.

The current PDB uses this checking to verify that all entries produced by the AutoDep software are well formed and have permitted values. Similar checks are performed after processing, just before releasing entries to the public. We also have grammars for the mmCIF, ASN.1 and XML formats.

Scenario 2 - Grammar-Directed Parsing

Using a grammar G and a document D from $L(G)$, GLASS can parse D , i.e., decompose the whole documents into parts, and these again into parts, where each part has associated with it a name (grammar symbol), coordinate in the name-space of the production rules P , a value (contiguous substring of D), and begin/end coordinates in the original document D .

Scenario 3 - Grammar-Directed Transformation

After parsing a document D using a grammar G , which includes transformation rules T , GLASS can translate D into $T(D)$. The output of this process can be either a parse graph of $T(D)$ or the complete $T(D)$ document, optionally validated against the target grammar G' , for which $T(D)$ belongs to $L(G')$. This transformation mechanism is used for translating PDB entries between the mmCIF and PDB file formats.

2. Parsing, validation and translation of PDB entries

Both the PDB schema (format of PDB entries) and the entries themselves have been traditionally managed as large semi-structured files. Validation and editing are done by invoking numerous tools on such files and essentially hand-editing the input to programs that generate the entries. Software tools for deposition, validation, processing, archival, and retrieval of PDB entries are all maintained and updated more or less independently of each other. Changes to syntactic or semantic specification of any system component are not necessarily uniformly applied to all affected programs.

The PDB archive will in the near future support the mmCIF format as its primary "canonical" format for file-based data exchange, and support for the traditional PDB format will be gradually phased out. Majority of software tools world-wide still depend on the PDB format. This is the main reason why, during a transition period, both the mmCIF and PDB format should be supported for both input and output operations on the PDB archive. And since the existing tools for translating between PDB and mmCIF do not do so without loss of information and/or without compromising the granularity of data representation, the PDB staff has undertaken the work of constructing a fine syntactic and semantic mapping between the two formats.

This mapping, together with the software implementation of it, constitute a means of high interoperability between the mmCIF and PDB formats, i.e., a way of translating entry files in both directions without losing information and/or distorting the intended meaning of the data.

For automated translation between two different formats, three pieces of information are required: unambiguous definition of the two formats, so that files in each one could be deterministically parsed, and an algorithmic description of how to transform a parsed file into the other format.

We have transformed the informal definition of the PDB format as in the PDB Contents Guide (versions 2.1 and 2.2), into a formal grammar with additional algebraic and logical constraints in the GLASS formalism. This grammar has 1308 production rules.

The mmCIF dictionary, together with its definition language (DDL), is already a formal grammatical representation. We have taken 1620 definitions from the official mmCIF Dictionary version 1.0.0, and added 315 definitions for a local PDB extension dictionary.

Since the order of categories within an mmCIF data block, and the order of items within a category instance, is arbitrary, and so is the style of formatting with respect to white space, comments, etc., we have also defined a preferred PDB order and style for mmCIF format. This part of the specification has 1996 rules.

The GLASS toolkit is used to interpret the grammatical and transformation rules. In addition, we have implemented 14 procedural functions (external methods for GLASS) for cases where pure GLASS transforms would end up being too slow, cumbersome to express, or impossible at all. Overall, it is much more flexible, cheaper, and less error-prone to maintain the declarations of 6,000+ rules and the procedural code of only 14 functions, as opposed to a fully procedural code of a general-purpose programming language.

3. Re-engineering the PDB information system

We outsourced most of the software development work to SoftDeC. The subject of the contract was:

- 3.a Design and implementation of a meta-database to define and to control all aspects of the PDB production system. The meta-database will be used by the system to manage the syntactic and semantic assumptions of PDB in an explicit and declarative way.
- 3.b Design and implementation of software tools to generate PDB system components (user interfaces for deposition and browsing, work-flow control, validation interfaces, user documentation, and the PDB database itself) from specifications in the meta-database.
- 3.c Implementation of a standard intranet solution to partition the PDB system and protect, by a firewall, its internal information and services from potential Internet attacks.
- 3.d Deployment of the re-engineered system into full production use, subsequent maintenance of the software, and training of the PDB staff to become fully self-sufficient in the operation and customization of the re-engineered system.

- 3.e Due to a recompetition of the PDB project during FY 1998, this contract was further modified to include work on more pressing needs of the PDB with regard to the review process. Specifically, SoftDeC agreed to help with the 3DB-base, AutoDep, and other existing software projects immediately relevant to the proposal/review of the PDB.

SoftDeC has practically completed all parts of the contract. Some delayed tasks (e.g., updated documentation) will be delivered by the end of the calendar year 1998 with no additional costs. The core GLASS components have been already deployed into production use at the PDB. Other components, such as the intranet firewall solution or the database user interfaces were developed, but they will likely not be deployed into production use, as the PDB will transition its operation from BNL.

4. Conclusion

The second phase undertaken on this project during FY 1998 was technically successful. We have significantly improved the PDB system, and we have also developed powerful technology which can be further applied to other areas of bioinformatics and scientific knowledge management in general.

Appendix A

BROOKHAVEN NATIONAL LABORATORY GUIDELINES AND PROCEDURES FOR DEVELOPING REQUESTS VIA THE LABORATORY ROYALTY USE PROGRAM

PURPOSE

Provide opportunities for education and training, increased scientific interaction both internally and externally, technology transfer activities, as well as stimulating new initiatives and research partnerships.

GENERAL

Key elements of the Laboratory's overall mission are noted in the above "PURPOSE" of this guideline. Inventions made at the Brookhaven National Laboratory (BNL) have the potential for generating additional net revenues. It, therefore, is appropriate to use these royalty funds in support of the foregoing endeavors, as well as to assist in maintaining the scientific excellence and the overall vitality of the Laboratory. Such use of these funds is also a means to stimulate and challenge BNL's staff and to obtain support for new initiatives in a relatively short time.

PRIME CONTRACT REQUIREMENTS

Articles 99, Patent Rights (Modified) and 102, Technology Transfer of the Prime Contract between Brookhaven Science Associates (BSA) and the United States Department of Energy (DOE) for the operation of BNL, require BSA to use the balance of any royalties or income earned and retained by it during any fiscal year, from subject inventions under the Prime Contract, for scientific research, development and education purposes consistent with the research and development mission and objectives of the facility, including activities that increase the licensing potential of other inventions.

Paragraph (k)(3) of Article 99 also established a five percent (5%) limit for such use of the total BNL budget. If the retained balance exceeds five percent (5%) of the annual facility budget, seventy-five percent (75%) of the excess above the limit is paid to the U.S. Treasury, with the remaining twenty-five percent (25%) to be used only for the purposes described above.

Finally, paragraph (h)(3) of Article 102 requires an annual plan, which sets forth those uses to which the funds will be applied at the facility, and at year end, also to provide a separate accounting of how those funds were actually used. Under no circumstances will these royalties and income be used for an illegal augmentation of funds furnished by the U.S. Government.

PROGRAM DESCRIPTION

Activities expected to be funded by this program fall into the following broad categories. Examples cited for each category should not be considered all inclusive but are representative of the types of activities expected. The use of all funds will be consistent with the mission and objectives of the Laboratory.

1. Education and Training Activities:

Support training and educational activities to postdoctoral research associates, PhD and Master Degree students and undergraduate and high school students and teachers. This category would

also include salary support and stipends for individuals, as well as necessary materials and supplies.

2. Cooperative Ventures:

Support joint efforts with universities to recruit graduate students who will receive their training at BNL.

3. Technology Transfer Activities:

Support joint efforts on existing and new initiatives with industry, universities, not for profits, and/or other government agencies, including activities that increase the licensing potential of existing or new inventions at BNL.

4. New R&D Initiatives:

Support appropriate research and development activities similar to the Laboratory Directed Research and Development Program, as well as to stimulate other new initiatives and research partnerships. These latter cases often require monies that are not readily available, or not in the time frame required. This category allows support for these efforts or to take advantage of research support in those cases where it is necessary to match funds from industry, universities, not for profits, and/or other government agencies.

5. Other Laboratory Director Discretionary Programs:

Support travel costs and honoraria for outside speakers to attend seminars and workshops dedicated to generating new ideas or concepts. Funds could also be used to purchase items and serviced not directly related to a specific scientific program such as scientific books and journals.

RESTRICTIONS

- Royalty funds are only to be used for scientific research, development, and educational purposes consistent with the research and development mission and objectives of the BNL.
- Royalty funds are only to be used for "**allowable**" expenditures as defined by BSA's Prime Contract with the DOE for the operation of BNL (Article 32, Allowable Costs and Fixed Fee [Sept. 1991]).
- Awards will not be made to substitute for, or increase funding for any tasks for which a specific limitation has been placed by Congress or the DOE or for any specific tasks that are funded by DOE or other users of the Laboratory.
- The activity will not require the acquisition of permanent staff.
- The approved activity will be limited to three years. Any funds **not used** will automatically

revert back to the Laboratory Director.

PROCEDURE

The steps for the preparation, submission, and approval of requests are as follows:

- The responsibility for the allocation of resources and the coordination, review, and selection lies with the Laboratory Director.
- The total amount of funds to be made available for the program, and accordingly the number of activities supported, will vary from year to year, dependent to a large extent on the balance of any royalty income earned and retained by BSA from inventions under its Prime Contract with the DOE for the operation of BNL.
- To the extent funds are made available by BSA from royalty income earned, the Laboratory Director will determine the amount of funds to be allocated to an organizational unit. In determining funding allocations, significant consideration will be given to the amount of royalty income generated by a particular organizational unit as well as previously distributed royalty funds to that organizational unit.
- Organizational units will be notified of the amount of royalty funds made available to them. Each will then be advised to submit a request(s) for the use of such funds, broken down by the aforementioned broad categories.
- Requests will consist of a Proposal Information Questionnaire (PIQ) outlining the planned use of funds. Applicants are encouraged to be brief but to provide sufficient information on the purpose and method of accomplishment. A copy of the attached questionnaire must be completed by the initiator and approved by the appropriate Department/Division Administrator, Department Chairperson, or Division Head, and the cognizant Associate/Assistant Director. If the proposed activity impacts an individual's program or work, plans to assure the satisfactory continuation of the individual's regularly funded programs or work must be approved by the Department Chairperson or Division Head and the Director.
- In reviewing submissions, consideration will be given to the merit of each request, excellence of concept, innovativeness, compliance with one of the above categories, relevance to the Laboratory's research and development mission and objectives of the facility, as well as the potential for future generation of revenues and impact on the scientific community, BNL, universities, industry, and the DOE.
- All requests (PIQs) will be submitted to the Assistant Laboratory Director for Finance & Administration (ALDFA) for coordination. The ALDFA will perform an initial screening to assure compliance with those guidelines and procedures and obtain any additional information deemed necessary.
- The Laboratory Director will review all requests and approve those activities or items to be

funded.

- When a specific request is finally authorized, the individual will be notified, as well as the cognizant Department Chairperson or Division Head, and the ALDFA. A separate BSA account will be established by the ALDFA to budget and collect the costs for the specific activity.

REPORTING REQUIREMENTS

- An annual report is required for each activity supported and must be submitted by October 31 to the ALDFA. This report is to provide a description of the activities supported by each of the broad categories previously indicated, along with associated dollars, as well as a description of any significant accomplishment, event, etc.
- The ALDFA will provide BSA and the DOE with an annual accounting of how these funds were actually used. In addition, the ALDFA will review reports for each activity to assure compliance with these guidelines and procedures.

TITLE OF PROPOSAL _____

(Provide a description of the requested activity (broken down by broad category) which highlights the purpose [including how it meets the general characteristics of the Royalty Use Program] and what it hopes to accomplish.)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

REQUESTED [attach a detailed Budget Breakdown]

(Break down the funding requested by the Major Broad Categories using the attached worksheet. For each category provide a breakdown of personnel [scientific, professional, technical, other] material and supplies, travel and other, including a brief explanation/breakdown [include the various burdens applied, i.e., materials, organizational and contracts. The Laboratory G&A should not be applied.]

OTHER

If this activity involves R&D or Technology Transfer activities, complete the following questions:

HUMAN SUBJECTS (Reference DOE Order 1300.3)

Are human subjects involved from BNL or collaborating institution? Y/N _____

If yes, attach copy of current Institutional Review Board Approval(s) and Informed Consent Form(s) from BNL and/or collaborating institution.

VERTEBRATE ANIMALS

Are vertebrate animals involved? Y/N _____

If yes, has approval from BNL's Animal Care and Use Committee been obtained? Y/N _____

NEPA REVIEW

Are the activities proposed similar to those now carried out in the department/division which have been previously reviewed for potential environmental impacts and compliance with federal, state, local rules and regulations, and BNL's Environment, Safety and Health Standards. (Therefore, proposed activities, if funded, would require no additional environmental evaluation.)

Y/N _____

If no, has a NEPA review been done in accordance with SEAPPM 1.3.0 and the results documented?

Y/N _____

(Note: If a NEPA review has not been done, no work may commence until the review is completed and documented.)

APPROVALS

Department/Division Administrator _____

Department Chairperson/Division Head _____

Cognizant Associate/Assistant Director _____

BUDGET REQUEST BY FISCAL YEAR
(Note: Approved Activity Limited to 3 Years)

COST ELEMENT	FISCAL YEAR _____	FISCAL YEAR _____	FISCAL YEAR _____
Labor * Fringe Total Labor Organizational Burden @ ____ %			
Materials Supplies Travel Services Total MST Materials Burden @ ____ %			
Sub-contracts Contracts Burden @ ____ %			
Electric Power ITD (CCD) Charge Other (specify)			
TOTAL PROJECT COST			
* Labor (indicate type of staff and level of effort)			
List all materials costing over \$5000.			