

## CHAPTER 6

### ADMINISTRATIVE MANAGEMENT

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## 6.1 Introduction

This chapter addresses the daily operation of an Engineering Research Center. Suggestions are based on common experiences shared by existing centers. However, there is no "right" way to manage an ERC. Major differences among institutions call for diverse management strategies; know your university environment and utilize only those suggestions most useful to you. Over time the model of a "typical" ERC has evolved from a single-university center, or an ERC located at one institution with collaborating universities, to multi-university partnership centers consisting of a lead institution with a number of significant but subordinate partner universities. Regardless of the organizational structure of the ERC, the totality of administrative requirements is essentially the same. Ideas, suggestions, and recommendations found in this chapter reflect the overall administrative needs of the ERC. Ultimate administrative and management responsibility and authority rest with the lead institution. However, the distribution of effort may be shared over several universities or among a number of individuals.

"Tips" appear throughout the chapter; these are intended primarily for the Administrative Director (or AD). Specific tasks and responsibilities may vary from one ERC to another depending upon the management structure of the specific ERC, the university culture, the qualifications and personality of the AD, and the preferences of the Center Director. The tasks and responsibilities will also change over time. But in spite of this variability, considerable consistency is found among AD responsibilities. A generic job description is provided as an attachment to this chapter (see Attachment 1).

All ADs are strongly encouraged to attend the annual NSF-ERC meeting held in October/November. For many of us, these annual meetings provide a unique opportunity to build a resource network. Chances are good that you will find such networking to be essential to your success.

Tip: Don't miss the informal AD sessions At the ERC annual meeting! New administrative directors consistently name these informal meetings with their peers as the single most important orientation activity open to them. Welcome to the ERC community!

## 6.2 The ERC'S Environment

The first task facing the administrator of an ERC is an analysis of the environment in which the center, and hence the AD, will function. Every aspect of center management will be enhanced by a thorough understanding of your "baseline" environment.

Make time to take stock of available resources and local circumstances. Failure to do so puts you in a reactive position. Effective strategies will differ based on size; public vs. private support; technical and industrial research areas; the current level of commitment from your home institution and opportunities to improve it; the requirements of collaborating organizations; the diversity of your student and faculty population; the age of your center; etc. The following information is designed to assist the AD in analyzing factors that shape the center's environment.

Tip: There may never be a better opportunity to negotiate favorable agreements than at the start-up of a new center. Always execute formal, written agreements; make sure that commitments of support are properly authorized.

### 6.2.1 Structure and Organization

There is no ideal organizational scheme for an ERC; every center will be (and should be) unique. Indeed, the creativity your ERC team brings to the development of the center is apt to serve as a model for future developments within your home institution. There are, however, two things you can count on: change, and the need to be flexible. Be sure to consider the following questions as you organize your infrastructure:

Within your university, where is your center in the organization chart? Will your Director report to an engineering department chair, dean, or some other university official? Will the center be a financially autonomous unit with independent bookkeeping? Will you be directly responsible for the financial management of the ERC? If not, who will? Your internal planning will be heavily influenced by this internal structure. To the extent that your university financial management system allows, spend time and thought in developing the 'chart of accounts' for your center. The 'chart of accounts' structure should become an essential tool for facilitating financial reporting. (See Section 6.4.5)

If your center is a part of a consortium: since one institution will be the lead on the award, how will the others interact and share in and contribute to ERC operations and resources? Failure to clarify and formalize these arrangements early on has led to serious problems at some centers.

How is your university Office of Contracts and Grants (Sponsored Research) organized? Does it have separate "pre-award" and "post-award" units? Does it include sponsored program accounting and training for university accounting (e.g., OMB Circular A-21, A-110, Cost Accounting Standards, university policies and procedures)? You need to understand your institution's research management hierarchy and how it functions. NSF now requires an authorized university official to certify the center's statements of industrial membership and support.

Do you have a copy of NSF's Cooperative Agreement? If not, obtain it, read it, and keep it on file, as it is the governing instrument for your award. Make yourself an expert on the nuances of your Cooperative Agreement; find out how it differs from normal grants and contracts. Keep a file of annual modifications made to the Cooperative Agreement. Expect to coach/train your grant administrator regarding the nature of an ERC. Often they will try to deal with your center as if your award is a normal federal grant or contract and that would be very inappropriate.

### 6.2.2 Fiscal Year Differences

Most centers find it necessary to deal with multiple fiscal and reporting years. Member companies will require unique fiscal periods, and the award years from NSF probably will not match your university fiscal period. These differences will have a profound impact on reporting requirements, staffing plans, and management of budgets, revenues, and expenses.

Tip: Evaluate your fixed reporting and budgeting schedule before planning a master calendar for your center. Staff key operations accordingly.

### 6.2.3 Life Cycle Changes Over Time

It helps to proactively anticipate major transition periods. Key events shaping the ERC often include meetings with industry; major external reviews (i.e., NSF annual reviews and renewal reviews in Years 3 and 6); building a new facility; any major remodeling activities and/or physical moves undertaken; and the eventual phase-down of NSF support in the later years of the award. Other

significant events will happen, often without warning. Any such changes--the naming of a new ERC Director; changes in participating faculty or key program staff; change among top university VIPs; assignment of a new NSF-ERC Program Director; or significant shifts in funding and staff--will alter strategic plans for the ERC in unexpected ways.

Centers are vulnerable to any significant change affecting universities, government, or industry. Of special concern will be economic and business factors affecting your member industries. As the ERC develops management plans, try to remember that it is natural to have cycles of growth and decline within center programs. Expect change; use the (inevitable) disruptions as an opportunity to improve!

## 6.3 Administrative Coordination of Center Activities

### 6.3.1 Range of Roles

In most centers, the Administrative Director will serve the entire ERC as the guardian of resources, policies, and myriad detail. The operative word is service. To be effective, the AD must have some knowledge of all center activities. Working closely with the Director, s/he must consistently maintain a "big picture" perspective. The Director and the AD must consider the needs of all stakeholders (NSF; member companies; the university; other funding agencies, including foundations, state or other government agencies; center faculty; students; and other staff). With the involvement of the other leaders of the ERC, they must also balance potentially competitive internal resource demands (e.g., research, education, technology transfer, and management). The AD usually provides the "glue" that holds the various administrative functions of the center together. The ERC Director will count on delegating a great deal to the Administrative Director in order to protect time. This partnership is crucial and should be considered carefully when staffing this position.

The Administrative Director is apt to wear many hats. The AD usually:

- assists the Center Director in the overall management of the ERC;
- acts as guardian of rules, regulations, and policies;
- serves as the information "gatekeeper" and resource for all members of the center; and
- is the center's financial and personnel manager.

A word of caution: As your partnership with the Center Director evolves, be careful not to let him or her delegate to you responsibilities that should be carried out by the Director or the Executive Committee. Even though the confidence shown in you might be gratifying and the authority appealing, the consequences can be damaging, both for you and the center.

Delegation is an essential skill for all ERC personnel. For the AD, the most frequently delegated tasks include those related to event management, communications, routine accounting and payroll documents, facility management, and center tours. Functions that cannot be easily delegated by the AD include assisting the Center Director with strategic planning and policy development; financial management; staff development; and the design/maintenance of the ERC information system that supports center reporting.

The AD plays an important role in the ERC's strategic planning by adding an operational perspective to the planning process. Among the considerations the AD should bring to planning are: personnel and staffing needs balanced with university, state, union, and other restrictions and requirements; an understanding of the life cycle changes of an ERC; budget constraints and requirements; and a center-wide commitment to all ERC constituent needs and functions.

Tip: Become actively involved in at least one professional organization (preferably one that monitors changing standards for financial managers, such as NACUBO or NCURA; see Attachment 4, "Glossary," for details). You are apt to find these contacts and resources for continuing professional education to be very valuable to you, and thus to your center.

As a key member of the ERC management team, the AD is usually a member of important ERC committees. These will vary, to some extent, with each individual center, but typical committees are:

- Executive/Management/Steering Committee (center faculty and management)
- Education/Outreach Committee
- Facilities/Space Committee
- Budget Committee.

### 6.3.2 On Management Styles

Centers attract creative, entrepreneurial individuals eager to build something new. "Turf struggles" are to be expected. It helps to understand the natural tensions at work in the center.

The need for strong, entrepreneurial leadership must be balanced against the need for internal structure, planning, and stable operating systems. (Enter the AD.) Everyone agrees that the ability to shape decisions and change directions rapidly is especially urgent during the earliest stages of the ERC life cycle; you must do everything possible to support your Director in meeting this challenge. Some suggest that these early "entrepreneurial years" should be followed by a managerial style focused more on planning and organization. Others among us believe that an ERC must always balance a dynamic tension between creative change and organizational stability. Indeed, this focus on innovation helps to explain the unique character of Engineering Research Centers. It also helps to explain the crucial need for a close, cooperative professional relationship between the AD and the Center Director, as well as other members of the Executive Committee. (See also Chapter 2, "Center Leadership and Strategic Direction.")

Whatever the specific situation at your center, you can expect a subtle shift in management expectations over time. As the ERC grows and matures, the exciting bursts of activity required to do something for the first time are replaced by a heightened focus on longer-term goals and mission achievement. Delegation, collaboration, and teamwork become increasingly important. To improve the ERC's ability to negotiate these transitions smoothly, it may be desirable for the Center Director and Deputy Director, the AD, and key faculty members to take courses in personnel management and team building.

Tip: It is especially important for the AD to have good interpersonal skills. This is the one position that interacts from a management perspective with every other position and function in the ERC, from the Director and Executive Committee to the clerk-typists and undergraduates.

### 6.4 Financial Management

In most ERCs the AD is responsible for financial management. However, in some centers this function is assigned to a financial specialist who may or may not report to the AD. As financial manager, the AD is the authorized representative of the ERC Director and usually has full signature authority. S/he

is required to handle budgets, distribution of funds (under the direction of the Director and his/her Executive Committee), expenditure approvals, projections, and reports. It is the AD's responsibility to insure adherence to university and sponsors' policies and procedures.

Tip: Obtain copies of NSF Documents GC-1 (Grant General Conditions); CA-1 (Cooperative Agreement General Conditions) and GPM (Grant Policy Manual); be conversant with their terms and conditions. Request the documents from NSF by mail or from the following Web site:  
<http://www.nsf.gov/cgi-bin/pubsys/browser/odbrowse.pl>

#### 6.4.1 The Financial System

A financial management system that complies with federal, state, and institutional regulations has been established at most universities. However, many institutions of higher education are currently overhauling their financial management and related computer systems. Your university may be engaged in extensive development projects. As a cross-disciplinary center, your special needs place you in the thick of this activity. Again, determine your operating environment! You need to understand the financial reporting capabilities available on your campus. Specifically, how much help can you expect from the university's financial reporting system?

Questions to ask regarding your university system include:

\*Does the university provide financial management information in a timely manner? Will reports reflect activity and encumbrances immediately, giving an accurate report of funds remaining?

\*Do the codes embedded in your university's central system include all of the expense and revenue categories required for ERC reporting? (See "Financial" in Attachment 2.)

\*Does the general ledger system allow you to post "soft" money or "pre-encumbrances"?

\*Is the system interactive or query only? Can you set the parameters for the queries?

\*Can you link your internal ERC system with the university system? ERCs use both the centralized system and their own detailed internal system. How will you reconcile your internal records with the central ledger?

Tip: Find out how to "download" (transfer) data from central administration records to your local computer network. Caution: Test your data and understand central refresh schedules! For example, has un-encumbering been reflected correctly?

#### 6.4.2 The University Chart of Accounts

The traditional, hierarchical nature of the university is clearly evident within most charts of accounts structures. The assumption is that all organizational units within the institution are discrete, and fit neatly into this design. Because the ERC is interdisciplinary (and sometimes inter-institutional), a unique code may not be assigned to all relevant financial activity. This is inconvenient and inconsistent because:

\*University reports are generated, organized, and routed based on this unit code (and, quite often, center activity is embedded within various department records).

\*Approval and access authorizations granted to the ERC within one university may not be consistent among all participating members of a partnership or consortium.

Because centers have not been a part of the traditional structure, you have to persevere to gain access to university/college communication and representation networks. Your center should, for example, be included on the "DDD" (deans, department heads, and directors) list. Center representatives should sit on relevant university committees, as well as attend key finance and personnel meetings. If routing of important communications is not automatic to the center, you must take the initiative to remedy this situation.

#### 6.4.3 The ERC Fiscal Year

Your ERC fiscal year will be based upon the funding cycle that is set by your NSF Cooperative Agreement. Other sources of funding may have different fiscal periods. Fiscal year-end differences will have an impact on the management of budgets, revenues, and expenses. Questions you will need to address include:

Which funds can be "rolled forward"? (Must you "use it or lose it"?)

How is "carry forward" calculated and managed? Is carry forward managed consistently for sponsored and non-sponsored funds? (At some institutions it is not, and this can cause special reporting problems).

Will you need to budget split fiscal years for revenues and expenditures? (How will you reconcile different fiscal years in summary reports for all funds?)

How will you "close" your books at the end of each fiscal year? What steps are needed to ensure that internal rebudgeting decisions are posted within the central system?

How will you manage grant close-outs and final reporting?

Tip: As AD, you need to clarify your responsibilities (and level of authority) in relation to your sponsored research office and any finance offices to which you report. Rules vary across institutions (and sometimes between sponsored and non-sponsored funds). In some circumstances, you will need to instruct another center employee who has the authority to actually conclude the transaction in question.

#### 6.4.4 Financial Reporting Requirements

Financial integrity is critical to the successful management and continuation of the center. Defining your center's financial reporting requirements is a top priority and will shape internal policies and procedures. You will need to report to all of the organizations that provide support to the center. You will also need to provide internal reports to center management.

Tip: It is wise to establish your financial reporting system as early as possible; this reduces serious risk, and it gives the AD time to proactively manage other concerns.

#### 6.4.4.1 External to the Center

The National Science Foundation is the primary sponsoring agency for all ERCs. As such, the NSF will require that you submit:

- the Annual Report (see Section 6.7.1.6) and Proposal based upon your NSF award year;
- an "Indicators Report" on ERC achievements and activities (mostly quantitative), due on or about the same time as the Annual Report; and
- special reports based upon specific one-time requests for information.

You may also need to generate special reports on state, university, other federal agency, foundation, and industrial support received.

Tip: Oversight of the ERC will exceed the norm within traditional departments; the review process becomes very time-intensive. When staffing the center, be sure you take these special demands into consideration. Failure to provide an adequate support structure for reporting requirements, major meetings, and site visits can actually bog things down and discourage cross-disciplinary activity.

#### 6.4.4.2 Internal to the Center

The ERC organization chart will help define your internal reporting requirements. The management team will determine what specific information is needed--by level (i.e., centerwide, thrust, project); by category (e.g., personnel, travel, equipment); and by function (e.g., research, education, administration).

Specifically, you may need to report to:

- the Director (center-wide summaries and function-specific analyses);
- Associate Directors for research, education, industrial liaison/technology transfer, and operations management;
- Thrust Area leaders by research group and project leaders under research thrusts;
- individual principal investigators participating in ERC research; and
- university administrators (e.g., dean, provost, president).

Tips: Evaluate your system from each of these "customer" perspectives to see if you are capturing the required detail. Prepare monthly summaries, and archive supporting detail consistently. (Even if you don't need it now, you will later!) Develop a timeline for preparation of reports. Project management software available commercially (e.g., Microsoft Project) may be helpful.

#### 6.4.5 Developing the ERC's Financial Management System

##### 6.4.5.1 The ERC Chart of Accounts

New ERCs will need to establish an internal "chart of accounts" system. It is very important to give careful thought to your coding system; this is the heart of the center's internal reporting structure. For example, some centers establish a "parent-child" account relationship in order to maintain stronger control of subsequent resource distribution. The "parent" account(s) may be sub-divided into various

"child" accounts for the purpose of distributing funds to the proper research thrust and sub-thrust areas.

#### 6.4.5.2 Budgeting

Budgeting takes place at all levels of the center. You need to know who is responsible for budgeting at each level and within each management area. You will need to determine a consultation and approval process, and a timetable, for establishing "functional budgets" (e.g., research funds by group; technology transfer; etc.). Be sure you know your Director's preferences.

##### 6.4.5.2.1 Budget Preparation

Formal budgets are needed for:

- each funding entity (NSF, State, university, sponsors); and
- sub-contractors (this may include industry and/or other institutions).

The return of Facilities and Administration (F & A) funds is a significant factor in the budget of some centers. If your center has this good fortune, you will need to know how F & A recovery (ICR) return is determined, and how is it distributed. Get your ICR agreement in writing!

##### 6.4.5.2.2 Management of Program Budgets

Identify who will be responsible for proposing and managing detailed internal budgets for each center function. Detailed budgets will be required for: research, at the center level and by thrust, project, and principal investigator; education, sometimes split by level/type (e.g., graduate, undergraduate, other); technology transfer or industrial collaboration; administration and/or management; infrastructure, including facilities, equipment, and computer networks; and other (e.g., for-fee-services provided; testbeds; etc.).

##### 6.4.5.2.3 Cost-sharing

Cost-sharing is required for many awards, including the NSF/ERC award. You should explore how your institution and NSF use terms like "cost-sharing" and "matching"; considerable differences in definition and implementation exist across institutions. The AD must check all agency and institute policies regarding cost sharing. Some institutions require that center not volunteer cost sharing. Therefore, only mandated cost sharing by the funding agency should be considered. Documentation for all cost shared and/or matching funds must be kept in an office file. Some institutions have special requirements for cost sharing of salaries.

Tip: Compare your institution's cost sharing policy with that of the funding agency. On average, the funding agency's policy will override that of your institution. Check your university award notice to clarify what figure NSF is using. Engineering Education and Centers Division management has suggested that ERCs be responsible for meeting cost-sharing requirements in relationship to the amount of funds that are directly under their control. This is generally the university's commitment of support to your ERC.

##### 6.4.5.2.4 Leveraging Funds

The concept of "leveraged funding" is extremely important to the functioning of the center and the achievement of ERC goals. By design, projects are highly interwoven and dependent upon one another.

The budget for an ERC may be complex, reflecting multiple funding sources with different award periods and different expectations. The AD needs to utilize funds to maximize the return on investment by each sponsor.

Your university contracts and grants system may not differentiate between a one-time contract to an individual investigator and the NSF Cooperative Agreement, with its assumption of multiple partners and leveraged funding. A mixture of long-term and short-term awards means that the center budget may exceed the limited time frame set for most university budget development processes. Allocations will cross department, college, and institution boundaries. Dealing with a system that is not geared to serve non-traditional units can be very frustrating. Yet ERC directors and administrators have been able to make sufficient adjustments, maintain a network of contacts, and negotiate solutions as the need arises. Under less-than-ideal conditions, they have been able to establish successful, efficient, and service-oriented administrative organizations. With the increase in interdisciplinary activity in academe generally, it is hoped that universities will create and/or modify systems and procedures to facilitate the administration of centers.

#### 6.4.5.2.5 Rebudgeting

The ERC Cooperative Agreement (and "expanded authority") allows considerable flexibility for rebudgeting and cash flow management to encourage cost leveraging. Close communication with your NSF Program Director is essential. Remember that each ERC sponsor will be eager to leverage their investment in the center and will be receptive to effective financial management strategies that make best use of total resources.

Tip: You may find it useful to develop initial budgets for each major funding source, documenting the intended use or purpose of separate funds (e.g., corporate dollars to research and university dollars for management overhead), and any cost-sharing requirements. You will also need to manage cash flow aggressively to leverage your resources (e.g., through investments and/or savings of F & A costs).

#### 6.4.5.3 Pre-Award Management

Each university has a proposal and budget review system that provides consistency in preparation of proposal budgets to satisfy both internal procedures and external regulations. This system is usually managed through the university's sponsored research office. It may be their responsibility to make sure that budgets are in compliance with regulations. This office checks for proper rates (e.g., employee fringe benefits and overhead), allowable costs, and that the budget is in compliance with the federal and state regulations.

Once the award has been received and reviewed by the university research office, a notice of award is sent to the ERC. The notice should contain the award/proposal number, budget period, any cost-sharing requirements, a continuation statement, terms and conditions, the principal investigator and key personnel, sponsor's code for type of funding, period of the award, report dates, and a copy of the cooperative agreement. You will need to obtain this information if it is not provided. The ERC financial manager (perhaps the AD) will develop operating budgets (based on the pre-award budget and the actual, final distribution from the agency) for the distribution of funds. You will need to coordinate with your central research and budget offices to establish new accounts and budgets.

In most cases, the pre-award staff will establish an account number for this award. This will enable ERC and university post-award managers to monitor all costs posted to the general ledger system. Account numbers are generally not created centrally until an award is received. When an award appears imminent and verification with the sponsor can be obtained, make a special request for a new account, to allow for the incurring of pre-award costs. Once accounts are established, continuation funds may be easily distributed. However, some circumstances require the establishment of new accounts each year upon renewal.

#### 6.4.5.4 Post-Award Accounting

The university has policies and procedures for purchasing goods and services. Knowledge of these regulations and the funding agency's regulations is imperative. All staff must be aware of cost principles governing expenditures of federal funds (e.g., OMB Circular A-21) and procurement procedures prescribed by federal regulations (i.e., OMB Circular A-110 and Federal Acquisition Regulations, and the Cost Accounting Standards Board, or CASB).

Grant management functions may be performed by both the post-award staff of your central university office and the ERC. These staff have varying levels of authority to approve transactions and commitments. Be sure to confirm role expectations!

Specific post-award activities include:

- account creation and maintenance
- on-line entry of budgets
- receiving, recording, and depositing revenue (including special gifts)
- keeping sponsorship and membership records
- invoicing membership and service fees at the appropriate time
- collection of past due amounts/accounts receivable
- expenditure review
- financial reporting
- communication with sponsors, auditors, faculty, and university administration
- close-out of activities when grant funds end
- documentation of cost sharing.

#### 6.4.5.4.1 Payroll

Suggestions regarding the appointment of ERC personnel are provided later in this chapter. It is important to note, however, that two-thirds of the funding available to the center is typically expended on people.

The financial manager must manage and/or clearly delegate responsibility for these activities:

- development of position descriptions
- keeping track of staff appointments, changes, and terminations
- payroll documents
- effort reporting
- compliance with union requirements
- negotiation/processing of classified vs. professional positions
- resolution of related issues (e.g., paperwork for visa/citizenship applications).

#### 6.4.5.4.2 Accounting for In-Kind Support and Gifts

If the center is the beneficiary of in-kind support (personnel, facilities, equipment, software, "deep discounts") you will need procedures to determine and record the value of those contributions or gifts. Become familiar with university policy and procedures for recognizing such gifts as revenue, and as items within the property accounting system. You will need to document the value of the gift. The value placed on people must include salaries and benefits. If the center is the beneficiary of in-kind facilities and equipment, you will need to determine the value of facilities built at your site or made available for center use (on or off site) and record the value and ownership of equipment either donated or made available for center use (on or off site). Retention of all documentation proving the value is important.

#### 6.4.5.4.3 Purchasing Systems

A system will be needed to support the acquisition of materials, supplies, and equipment in a timely and efficient manner. Determine who will process and track purchase documents, and who will be authorized to approve acquisitions. Purchasing may be centralized within the center to provide monitoring control. However, this is more labor-intensive than distributed project management (purchasing done by participating PI departments). Any decision on appropriate purchasing strategies must involve the ERC Director, the AD and/or financial manager, and research leaders. Decentralized support systems also require good networking between the ERC and departmental payroll and accounting personnel.

#### 6.4.5.4.4 Plant Funds and Capital Equipment

If funds are available for physical plant/infrastructure needs, you need to know who will manage these funds. In some cases the expenditures for physical plant will also meet cost-sharing commitments and a full accounting will be required. Who is responsible for inventory records and property accounting? Depreciation is handled differently at each university; you need to know how your institution will deal with equipment purchased for the ERC.

#### 6.4.5.5 Other Financial Activities

Managing the ERC also requires attention to several other activities which have a financial impact on the operations of the center.

##### 6.4.5.5.1 Record Keeping

The retention of certain information is imperative. Does your university have a central record retention area (sometimes now referred to as a "data warehouse")? If so, how much historical data is kept? Can you query for any fiscal period? How quickly can you develop a report using central records? The following information must be easily accessible to the ERC:

- proposals and any revisions processed
- notice of award, with terms and conditions
- budget and expenditure detail
- subcontracts with all associated documentation
- copies of pertinent correspondence and internal/external approvals
- copies of all equipment requisitions and any professional service agreements
- copies of financial reports, including narrative/technical reports

- copies of all service-related documents (e.g., internally generated invoices, etc.)
- project/grant close-out documents
- signed copies of all agreements (memberships, collaborations, et al)
- copies of checks received as payments (memberships fees, et al)
- copies of documentation proving value for in-kind donations
- copies of all correspondence proving industrial relationships if a membership agreement is not in place

Be sure to check on retention policies; the ERC's grant period may exceed normal storage practices!

Tip: Many ERCs have found storage space to be a key concern. If you have the chance to build or remodel space, be sure to plan for this.

#### 6.4.5.5.2 Audits

The center is subject to both internal and external audits. Audits may be financial and/or operational. The general purpose of the university's audit is to show to the university that the ERC is well managed, in compliance with the university's own internal policies and federal regulations. An auditor may review all records, processes, purchases, and personnel records. It is usually the AD who manages the center's response to any audit.

Tip: There isn't adequate time to organize your records during an audit; be prepared! Retain as much detailed information as possible.

#### 6.4.5.5.3 Closing Out Accounts and Grants

Final reports often are required internally by the university, in addition to the requirements of the sponsoring agency. Detailed information may be required including: expenditures; unexpended balance; personnel (including person-months per category); technology licensed; patents; publications; and a research progress report.

Tip: Check at the start of the award for the deadline date for the close-out. Confirm university policy on close-out requirements. Maintain an active database throughout the award period.

#### 6.4.5.6 Staffing the Payroll and Accounting Functions

To maintain an excellent accounting system, it is important to appoint staff to handle high-volume, routine tasks (e.g., payroll documents, purchase orders, invoice processing, data base upkeep, etc.).

A crucial decision facing the AD and the Center Director concerns the level of training your accounting staff will need. Universities are rapidly adopting new, sophisticated financial management systems that require computer and accounting skills that may not yet be common at your institution. Essential qualifications are changing rapidly and most university job descriptions have not kept up. ERC accounting requirements will depend in part on how well your university's central financial system works; if it will be difficult to pull specialized reports from the mainframe, your staff will have to develop internal systems to meet this need.

### 6.5 Personnel Management

Effective staffing of the ERC is essential to the success of the center. Yet the pressures of starting a new center may lead to hurried hiring. Settle on an administrative structure before defining positions. Then proceed thoughtfully in writing ERC job descriptions; taking time now prevents problems later! You might consider filling immediate needs with temporary personnel. Special planning is required to be sure that the needs of the center are addressed.

### 6.5.1 Building an Effective ERC Staff

#### 6.5.1.1 Staff Size

An informal 1994 study of 17 ERCs indicated that center support staff ranged in number from 3 to 19. The average number of administrative support staff was 7 FTE (full-time equivalents). All centers report changes in staff over time, but no clear pattern of change has been documented. It is clear, however, that the center's current position in the ERC life cycle (start-up, mature, etc.) will affect staff size. Extra effort is required the first time you do anything new; thus, demand for staff support may be especially high during start-up and during key times of transition. It is essential that the Director and AD discuss budget limits (and forecasts) frankly and realistically.

Determine how large your ERC is expected to become, based on your strategic plan, and consider how ERC staff can be used to extend faculty expertise and time. (E.g., do you really want your faculty to edit newsletters, maintain databases, handle accounting transactions, maintain equipment, etc.?) Regardless of ERC size, it is the faculty who represent the core of the center; all other staffing must be built around this base in order to leverage your most precious resource: faculty expertise.

Remember the need for flexibility in managing ERC resources! In drafting employment agreements, be poised to balance the pressures of ERC growth and new program development against a simultaneous need for downsizing and reorganizing due to program shifts and funding changes over time. Traditional human resource practices and layoff policies may not accommodate simultaneous retrenchment and reallocation within one administrative unit. Anticipating problems in this area can positively influence your early personnel choices, and may prevent grievances, conflict with unions, and/or future litigation. Plan early for the phase-down of NSF support in grant years 9-10.

#### 6.5.1.2 Defining Job Descriptions

Some centers have a very small staff. In addition to general administration of the center, the Director and the AD may share responsibility for education programs, industrial collaboration, and outreach. This is not the most effective structure in the long run. Thus, the ERC Director typically appoints separate individuals with responsibility for administration, industrial liaison/technology transfer, education, and (sometimes) research management. A brief outline of essential ERC functions follows below.

General Management/Administration: Chapter 2 describes the responsibilities of the ERC Director. NSF now requires newly formed centers to also appoint a Deputy Director; this position is filled by a faculty member within the ERC. A "generic" job description for the ERC Administrative Director (AD) has been attached to this section as Attachment 1.

It is important that the roles of Director, Deputy Director, and Administrative Director be clearly distinguished; responsibility for research and administration must be clear. It is essential that there be a good working relationship among these key individuals.

Research: All centers appoint faculty managers of clusters of research projects or thrusts. Some also name an Associate Director for Research, although most Center Directors have retained this leadership role personally. These managers may hire additional technical and secretarial personnel. The majority of faculty and students are appointed through their participating academic departments. (See Chapter 3, "Research Management".)

Industrial Collaboration/Technology Transfer: There is significant diversity among ERCs in staffing this function, and some centers have struggled before finding the "right" approach to technology transfer. It is wise to evaluate optional strategies and to consider your environment carefully. For example, there are different advantages to hiring someone with an industrial, faculty, or business background. Ultimately, this individual must be familiar with the center's research and be able to serve as a liaison between the faculty and industry representatives (including potential members). (See Chapter 5, "Industrial Collaboration and Technology Transfer.")

Education: This management position is usually held by an ERC faculty member. The tasks of the Education Coordinator vary across the centers, but often there is a staff person who fills this role in coordination with the faculty. S/he is responsible for the development and execution of the center's outreach programs, curriculum development, and course modifications. As with the technology transfer function, it is imperative that whoever has this responsibility work closely and well with the ERC faculty. (See Chapter 4, "Education Programs.")

The ERC Main Office (reception, secretarial, administrative assistance): Whether you have a one-person office or a large staff, remember that the individual who answers the phone and greets guests is the face and voice of the center. This first point of contact is tremendously important and the position demands professional judgment and intelligence. The staff responsible for "the front office" usually provide administrative assistance to the Center Director and other management personnel. At same time, they must manage a (sometimes daunting) load of routine tasks. Many centers have experienced problems trying to find and keep good people in these posts. Some centers successfully supplement regular staff with student help. ERC orientation and training are critical for all staff.

Accounting: You must determine the level of trained accounting help required. (See Section 6.4, "Financial Management.") Most centers have found they need a dedicated staff position for daily accounting and payroll operations.

Information Systems: Staffing this function adequately may be pivotal to a smooth-running center over the long haul. As an ERC matures, computer systems save valuable time and enable a small, coordinated ERC team to handle growing demands and constant change. Some centers have added system administrators to their staff. Others rely on faculty, students, or existing staff to learn new technology. Be sure to determine how you will gain access to the expertise needed to design databases, develop downloading routines from central data warehouses, maintain a local area network, and build home pages on the World Wide Web (WWW). (See Section 6.7, "Information Management and Communication.")

Communication: There is a great deal of variability among existing centers in staffing this area. This may reflect the fact that many professionals within the ERC are in a position to make creative contributions to center publications. Certainly, all centers must write, edit, and produce general and technical communications. A few centers have dedicated positions devoted to graphics, editorial, and/or multimedia/computer systems support, while others have opted to outsource the actual production of publications. Also see the section on "Information Management and Communication" (6.7) for comments on electronic publishing. WWW capability is increasingly important, as NSF reporting and database systems now rely on the Web and outside contacts can use the Web to become

familiar with your ERC. It can be used to provide special access for members to ongoing work and results.

In all support functions, budget and space will limit your staffing plans. Consider the use of temporary vs. permanent employees, student assistants, and outsourcing to university and external services or consultants. You will want to review the ERC's master planning calendar and evaluate peak periods and functional conflicts (e.g., you might find that one person could coordinate annual report production, produce a newsletter, run the industry meetings, and oversee the annual budget preparation process, if only these tasks didn't all peak at the same time).

When university students are employed, the center must determine what constitutes appropriate student involvement that does not interfere with their educational objectives. Nonetheless, student employees have worked out very well for centers. Duties vary from routine office tasks to dissemination of information on the WWW; technical assistance; coordination of REU and other educational outreach activities; and computer support.

Tip: Time management will be terribly important to any ERC, but especially one with a small staff. Each ERC member must realistically determine whether or not a job may be shared. As AD, you must facilitate this process and be prepared for times when the center needs extra help.

#### 6.5.1.3 Position Titles

Explore your university personnel system(s) before finalizing position descriptions. Don't limit yourself to the most commonly used classifications. Many centers have found that existing university personnel titles and pay scales are outdated and do not fit their needs well. Chances are good that there are alternative titles and options open to you. Review overall center functions/tasks, and then proceed to define specific ERC positions. Determine essential qualifications before you begin to recruit and screen individuals.

Your university already has central Personnel staff who can provide help. They can guide you in the use of employment categories/titles, and can help to ensure that the university complies with laws and regulations regarding recruiting, hiring, conditions of employment, and termination. The university's personnel policies also address regulatory issues such as equal employment opportunity, nondiscrimination, sexual harassment, and drug and alcohol abuse.

Tip: If you are having difficulty with your university's Human Resources or Compensation offices in classifying positions or allowing appropriate salaries because there are few, if any, similar positions on your campus, check with the ADs at existing ERCs. They may be able to provide you with comparable job descriptions or salary ranges in order to help you convince your university of the appropriate levels of compensation to match ERC needs.

#### 6.5.1.4 Before You Hire

You may want to consider alternative appointment strategies. For instance, under what circumstances should tenured faculty be funded by the ERC? Will the center need to have the department hire new faculty? Some centers do not pay participating faculty salaries; rather, continued department support of faculty lines is viewed as the appropriate "contribution" in return for student support and other benefits that come with center involvement. Additionally, much of the funding that comes to the ERC is "soft" (not backed by continuing state allocations or private endowments.) Most institutions require

"hard" financial backing for tenured positions. NSF will ask each center to examine the progress of young faculty towards tenure. (See also Chapter 3, "Research Management.")

Your center may have the option to appoint non-faculty staff directly within the ERC, or else to process appointment documents through participating academic departments. Which approach will better enhance cross-disciplinary cooperation within your institution? This issue also calls for an evaluation of several operational and resource concerns. You need to decide where students will pick up their checks, how much assistance you can expect from support staff in participating departments, and the availability of special university services (e.g., staff to work with individuals experiencing visa difficulties, etc.).

Be clear about conflict resolution procedures. The AD will receive requests and advice from all of the key players (internal and external to the ERC). Competing opinions and needs are inevitable. Personnel conflicts will arise when clear job definitions are not established. This may be especially difficult if there is not a clear understanding about who supervises staff and how problems will be resolved. Typically the AD will negotiate these situations, referring problems to the Center Director (and any committees or governing bodies), as appropriate.

You should recognize the important role the AD can play, through hiring decisions, in supporting the careers of women, minorities, and the disabled. NSF encourages diversity in the administrative staff of ERCs as well as the faculty. On many campuses, ERCs can serve as role models in how to do this well.

### 6.5.2 Special Challenges Facing Cross-Disciplinary Centers

Efficiency must be a special priority. Center processes must expedite collaboration across participating units. If, for example, it takes longer to hire someone, to get something purchased, or to process a grant, faculty will shy away from involvement with the ERC. Yet additional authorizations may be required and can easily lead to bureaucratic delays. Organization and planning are critical!

It is important to hire and consistently train all staff to enhance and facilitate activities in the participating academic departments. Relations with participating departments need to be nurtured carefully.

NSF site review teams will ask to meet privately with students and industry representatives during external site reviews. It will reflect poorly on the ERC if these individuals don't have a clear idea of what the center does and what their role is with the ERC. The center needs to find ways to build a clear identity with students and others without violating individual loyalties to existing organizations. It can be, of course, a powerful mechanism for getting diverse groups together (students with industry, researchers from diverse disciplines, etc.).

Establishing your center's identity as a unique entity on campus is important. Problems can arise, however, when both the home department and the center vie for individual loyalties, resources, or recognition. The ERC must build a separate identity, without competing with participating departments.

How will your ERC involve participating department personnel directly in center affairs? This may entail cooperative agreements for staff assistance; fund transfers between the ERC and participating units; shared accounting; etc. Coordinating with other department staff has several advantages: it gives home units control over some funds and activities; it documents and gives credit to participating

faculty with their department heads; and it may save money by avoiding the need to expand accounting and support staff.

### 6.5.3 Evaluating and Rewarding ERC Personnel

Make time to thank staff and recognize them. While we all do it, we rarely do it often enough. There are many ways to recognize and support outstanding ERC personnel. Some examples:

- Develop a consistent performance evaluation process.
- Provide staff development and training (including time management; dealing with change; and computer skills).
- Experiment with team building/quality circles, etc.
- Attend professional meetings.
- Recognize staff at formal ERC meetings and events.
- Nominate outstanding employees for university awards.
- Develop flex-time policies.
- Support some social activities.
- Provide special rewards programs for internal system improvements.

Tip: Include allocations for both staff development and computer upgrades in your management budget. Be sure to stay within university guidelines in rewarding or paying center staff; don't develop your own pay scales outside these guidelines.

### 6.5.4 Personnel Records and Reports

It is essential that an accurate and up-to-date record of all ERC personnel be maintained. Reporting agencies set guidelines on the type of personnel reports required (e.g., federal grants require effort reports on the number of hours devoted to the project). Check the requirements for the tables in the NSF Annual Report and the NSF Indicators Report carefully. A suggested database guide has been provided as Attachment 2.

Tips: Consistency in how the information is gathered and managed is imperative. It is recommended that only one or two people be allowed to change data. Some information will be confidential, so file sharing must be carefully considered.

Sponsors, including the federal government, require a wide variety of personnel statistics. It will be important for you to distinguish/track the following in your records:

- headcount (the number of individuals) vs. FTE counts;
- paid (salaried) vs. otherwise supported personnel;
- directly supported students vs. those indirectly involved (as in taking ERC-influenced courses) to provide the total number of students "impacted" by the ERC;
- historical information (e.g., personnel over time);
- ERC student detail;
- ERC faculty detail (e.g., core faculty vs. participating faculty; visiting faculty);
- gender/racial/ethnic classifications and other personal data;
- ERC program affiliations and program changes over time;
- time and effort reporting, for any personnel paid on federal funds; and

alumni information, including address after leaving the ERC.

## 6.6 Facilities Management

While contiguous space is the ideal mode to foster team-building, especially among students, it is common for an ERC to begin life in discontinuous space across campus or "camped out" in temporary space. Faculty (and many students) will likely retain space in affiliated departments and conduct ERC research in those facilities. This situation continues for many existing centers. To date, few ERCs are housed in entirely new, contiguous space, although building is planned at several universities. The time to press for contiguous space is during the first year, when the pressure of the third-year renewal can be used to your advantage (see Chapter 2, Section 2.5.1.1).

### 6.6.1 Planning for Facilities

#### 6.6.1.1 Defining Space Needs

When an Engineering Research Center is established, a planning group needs to define the center's space and facility needs. Here again, knowing your university environment is very important. Each campus offers unique challenges. The value of building a network of contacts across campus cannot be understated.

The questions that follow here need to be addressed.

What space is currently available?

Is major renovation needed?

Has the university pledged to share the costs of renovation or development of new space?

Will you need to raise funds for the new space?

Will you need to move into temporary space during renovation?

When is that space available? What is the impact on research likely to be?

Who controls facilities management within the university system?

Will you need to deal with an outside architectural firm?

Will you need to hire outside contractors?

Who will be the "ERC Facilities Manager" during the construction period?

Who will be the "ERC Facilities Manager" after the Center occupies the new space?

Identifying long-term facility needs is critical. Keep research, education, and technology transfer goals in mind. At what phase of the ERC's life cycle will specialized facilities be required to accomplish the long-range goals of the ERC? Negotiate agreements for growth as the ERC matures. Some universities have established requirements for retaining or gaining facility space based upon grant dollars awarded and F & A costs returned to the university. Another option for some centers has been acquiring off-campus space. Check university policies regarding off-campus space prior to the planning stage.

#### 6.6.1.2 Potential Space Needs

ERC functions to consider when identifying space needs include:

research;

conferences/meetings and seminars (needed for cross-disciplinary collaboration);  
student carrels (undergraduate and graduate);  
space for visitors (lab and office);  
computer network/workstation facilities;  
offices for administration, faculty, and staff;  
training facilities;  
multimedia laboratories and teleconferencing;  
storage rooms and closet space;  
security systems; and  
signage.

Identify who will be responsible for allocating space within the ERC. Prioritize future needs (data/network connections; administrative vs. laboratory vs. storage needs; new laboratories; etc.). Always try to build in flexibility for (unknown) future requirements. Identify who will be responsible for keeping a schedule for all rotating space (e.g., the conference room).

### 6.6.1.3 Shared Space

Will the ERC be housed in existing space with other engineering units, or will it be assigned independent space on campus? There are benefits to either situation. Common-use space shared with other departments or centers often comes with certain amenities (e.g., shared computer network facility costs; increased collaboration with other faculty members; and shared cost of laboratory renovation/remodeling and administrative support staff). If space is to be shared, be sure to secure written agreements, so as to avoid conflicts. Some ERCs have shared labs for specific research groups. Some provide offices for students, while others have common areas for students.

### 6.6.1.4 Funding

The ERC must identify the source of funds for the purchase and maintenance of equipment, laboratory renovations, computers, and furnishings. Annual budgeting should always include a thorough re-evaluation of facility and equipment needs. Pursue all available options for matching funds (e.g., university, dean, equipment grants, individual PI grants, private foundations). See also chapters on Leadership (2) and Research (3).

Space use is a sensitive issue on most campuses; high-quality laboratory space may be especially limited. Encourage realistic consideration of long-term needs with maximum efficiency in mind.

### 6.6.1.5 Building and Remodeling

It is critical that one person from the center be delegated to work with the appropriate architect, contractor(s), and building supervisor from the beginning to the end of the project. This individual will also work with ERC faculty and technical staff to oversee construction progress to: stage the move, keeping all parties informed of on-going experiments, research and teaching considerations, etc.; and plan for a transition with maximum efficiency and minimum disruptions.

It is helpful if this individual knows something about your technology and facility use. It is even more important, however, that s/he be a stickler for detail. You want someone overseeing the work on a daily basis who will be on-site, and who will nit-pick progress, estimates, and actual charges. Very significant savings can result from this careful attention to construction deadlines and costs.

Tip: Expect down-time for research and communications (phone, computer networks, etc.). Notify sponsors of service interruptions.

## 6.6.2 Facilities Support Systems and Services

### 6.6.2.1 Laboratory Facilities

If your center laboratories (or testbed) operate as a service center (i.e., charging user fees), your system must include detailed records of instrument use (including supplies used and technician time booked); billing or invoicing records; payments; and collection efforts. Facility planning must be an ongoing process throughout the life cycle of the ERC.

Some centers have found it very beneficial to build an integrated information management system that allows automatic, electronic transfer of data from the initial scheduling of user time on instruments, to the billing clerk, then to the accounting department, and so forth. While it takes time to develop such internal systems, they may become one of the key strategies for survival as the ERC grows, and as funding levels off or declines. An adjusted user fee schedule may be needed for sponsoring companies versus other users. See also Section 3.3.1.3, "Testbeds," in the Research Management chapter.

### 6.6.2.2 Equipment

Tracking all equipment received by the ERC whether it is purchased or a gift/in-kind is very important. An inventory database needs to be maintained from the beginning. A list of required information is included in Attachment 2 (Database Files and Fields). You will need detailed records of equipment purchases, maintenance contracts, equipment fabrication projects, and any documents proving value for the gift/in-kind. You may need to coordinate equipment fabrication projects with your property accounting and sponsored research offices. Often a special code is required on your documents and in your records, so that overhead charges and depreciation are handled correctly by the institution. You will probably want your system to be capable of tracking capital equipment authorizations, as well as actual expense as it hits your general ledger. You will also need a record of the portion of total cost born by different funding sources. Often, central university systems fail to give you this information. (See Section 6.7, "Information Management.") Knowing the location of equipment can be crucial during an audit.

Identify maintenance needs for equipment purchased. Service contracts can be very expensive but may, in the long run, save significantly on down-time, support personnel, and replacement costs.

### 6.6.2.3 Office Space and Services

The center must provide necessary services to faculty, students, and others on site. These may include access to keys, telephone and fax services, office supplies, computers, printers, copier, and mail/package delivery.

## 6.6.3 Staffing Facilities Management Functions

Assigning office space is usually the AD's job. In some cases, the Administrative Director is also directly responsible for overall facilities management. However, other centers have found it necessary to hire a lab manager, who works with the AD, faculty, and technical staff to oversee laboratories and equipment and to handle maintenance, cleanliness, and safety (ensuring that the ERC meets federal/state standards and training requirements). This decision depends on the size of the ERC, the level of university support provided, and the availability of funds to support equipment and facility development.

If the ERC does manage a large facility, it is important to assign a building supervisor. This person is responsible for making sure everything is working properly and knowing whom to call to get problems corrected. For example, attention to lights, air conditioning, fume evacuation systems, heating, elevators, fire alarms, et al, will be required. In some centers, this individual may also coordinate group tours.

Tips: Always have a floor plan of your building handy that shows where personnel are located. Network! Knowing whom to call for specific problems can make the difference between getting the problem corrected quickly, or suffering the frustration and expense of long delays.

## 6.7 Information Management and Communication

### 6.7.1 Data/Information Planning and Systems

As early as possible, the ERC should have in place a systematic process for collecting and storing the large quantities of information needed to manage a multi million dollar operation. It is very important to examine your information needs *before* you build computerized data files (or employ a programmer). Find out what information is required for major reports required by your sponsors. Consult key customers of the center's information system. The objective is to collect all the information you will need and as little as possible of the information you will not need. Attachment 2 provides a starting place by identifying common ERC data files and fields.

In considering database design and implementation, you must also take into account the shape of the university information systems and any others from which you will be extracting data (see Sections 6.4.1 and 6.4.2). ERCs with many institutional partners will have to determine the most effective and cost-efficient way to gather and input data across the institutions and miles. Developing a web-based system offers the benefit of cross-platform access to the information system and allows for remote site entry. It is best to begin as soon as possible to share information files electronically within the ERC. For reporting purposes, it is ideal if the information is integrated into an information management *system*. Since some of this information will be deemed confidential, or sensitive in terms of ERC self-interest, you need to carefully consider a set of issues related to computer security and local area networks (see Section 6.7.1.10).

Tips: Work with a database designer and a programmer to develop an appropriate design of the ERC's information management system. Prioritize your information needs. To the extent possible, avoid complex, high maintenance systems. Build in flexibility for changes and additions; they are inevitable. Document database system development carefully. Be sure data entry personnel understand the system. Poor training at this level can sabotage even the best system! Push *using* the system, and make it easy to use. The onus is on the professional to design a usable system, not on the user to learn a complex, fragile one.

#### 6.7.1.1 Essential File Elements Within The Center's Information Management System

Key information needed by the ERC includes:

- Mailing list (a single, coordinated list for the entire center)
- Calendar (at *least* keep one for the core ERC office team)
- Personnel (include faculty, staff, consultants, and temps!)
- Students and alumni (include a history of ERC fellowships, stipends, employment, and gender/minority/disabled status)
- Industrial memberships (include a key interactions log)
- Invention disclosures, patents and licenses
- Publications (all should formally acknowledge ERC Program support)
- Capital equipment and assets (purchased and donated)
- Financial records (see section 6.7.1.3 for more detail)
- Grant proposals (include pre-award authorizations and end dates to monitor for NSF base award and any supplemental awards from other agencies)
- Inventories (e.g., ERC computer hardware and software, licensing agreements)
- Detailed information on outcomes and impacts of the ERC on technology advancement

You will also need a record of ERC activities. For example, you will want to record attendance, by category, at major meetings and workshops; industrial visits to your center; research on-site by industrial participants; and research activities or visits at member companies by ERC faculty and students.

Tip: Some centers are currently experimenting with new methods of registering people for major ERC Technical Advisory Committee (TAC) meetings. In the offing is the use of electronic mail and interactive forms on the Internet to capture information electronically and transfer data directly to the center's database.

#### 6.7.1.2 What Hardware and Software Do We Need to Get Started?

Existing centers use a wide variety of computer equipment. Most are utilizing local area networks comprised of PCs and/or Macintosh computers. The ERC program management is mostly PC-based, but some Program Directors use Macs. Conversion software and electronic mail have reduced the difficulties once experienced due to the diversity of hardware and software in use. Microsoft Word currently seems to be the most frequently used word processing program. There are many different programs in use for desktop publishing and graphics; you will want to explore the capabilities of software to handle scientific formulas and special symbols in use at your center. The majority of current ERCs use Filemaker Pro or Access for their databases. However, Excel, FoxPro, and other custom programs are also used.

Information management systems evolve over time. While technology is constantly changing, the management information system should be consistently managed to relieve pressure on staff. This becomes essential as resources stabilize (or fall). Initially, you will be consumed with the *creation* of the system. However, don't neglect issues related to maintenance and security (see Section 6.7.1.10, "Managing Your Information System"). You will need to test your system against central capabilities, as well as audit requirements and other regulations. Historical retention of data is crucial and usually must be maintained within the center. You will need to determine what records are public. You will need to establish rules about who can enter/edit your data and who can read it.

#### 6.7.1.3 About Financial Records

For any enterprise as large as an ERC, keeping accurate financial records is crucial. The majority of existing ERCs use spreadsheets (usually Excel) as their primary financial management tool. A few of the centers also keep essential fiscal data in an internal database or data warehouse. Key files include the ERC chart of accounts; a historical record of ERC income; and annual records of budget, revenue, and expense. You must also keep track of indirect support to the ERC: projects supported directly to the PI, not through the center, but consistent with the research vision of the center.

Tip: You will need to be able to manipulate data by month, by thrust and sub-thrust area, and by unique account strings or groups in order to develop the ERC's functional budget as required by NSF.

If your center manages invoicing, you will need a detailed record of invoices and payments, including all efforts made to collect overdue accounts. If your center allocates ERC funds to participating departments or other universities through an outreach program or under a joint institutional arrangement, you will need to anticipate these needs, hold funds to meet them, and keep a detailed record of fund transfers. Some centers need to keep a history of subcontracts. You will need detailed records of capital equipment purchases, maintenance contracts, and any equipment fabrication projects. (See Section 6.6, "Facilities Management.") In order to comply with NSF's requirement that your Sponsored Research office verify your membership lists and funding sources, you will have to have records of membership agreements by firms, invoices, accurate data on in-kind contributions, etc.

#### 6.7.1.4 Other Data Gathering Challenges

Many centers report that the most difficult reporting area is technology transfer. This difficulty may reflect the number of people and interactions involved, as well as the sensitivity and technical nature of these exchanges. You will want to plan this aspect of data gathering with your faculty and with the ERC personnel responsible for industry collaborations. The center needs a strategy for capturing information on company visits, student and faculty time at companies, technology transferred, success stories, technical and economic challenges affecting your industries, and more. (Please refer to Chapter 5, "Industrial Collaboration and Technology Transfer.")

In the early years of the ERC Program, many center administrators had trouble defining ERC metrics. Making existing data fit into categories different from those for which they were originally collected was often a considerable challenge. Much progress has been made in clarifying the definitions now used in the Indicators and Annual Reports. You need to determine what *kinds* of and how *much* information you want to keep. Some potential metrics are:

- the participants on center research projects;
- the number and category of individuals paid by the ERC;
- summer students;
- enrollment in an ERC class;
- the number and type of participants in center workshops or meetings;
- ERC seminar attendees;
- special visitors to the center (e.g., high school students);
- ERC personnel who conducted research at a member company;
- the individuals who presented a talk and/or poster at your ERC meetings;
- industrial representatives who work with your core faculty;
- ERC individuals who are award recipients;
- ERC alumni who went to work for a member company;
- member companies;
- how member companies participate and support the ERC;

the duration of their membership; and  
ERC and ERC individuals' publications.

It can also be difficult to capture information on diversity (i.e., ethnic, minority, and visa status). You will probably want a standard form that all students use to voluntarily self-disclose this information. Be sure to refer to current federal classifications for codes for these categories of people.

Keep track of your graduates from Day One! You will need to know what happens to them, where they go, and how to reach them - for the ERC's purposes as well as NSF's. (NSF periodically surveys ERC graduates and their supervisors.) It is best to design the information collection process to capture information on graduates *systematically*, at the end of each university term. Get to know the department staff responsible for processing graduating students. They are an invaluable source of information. Have a plan for how you will communicate with alumni, and do so at least two or three times each year. (The latter is important because of the postal service's mail-forwarding practices.)

No matter how difficult, all data collection is made significantly easier by adequate pre-planning and appropriate design of the information system.

#### 6.7.1.5 Collecting Information from Your Faculty

Most ERC ADs agree that collecting information from a busy, dispersed faculty is one of the most significant challenges during the early years in a new center. Remember that your scarcest resource is faculty time. Making information collection and reporting as easy as possible becomes one of the primary ways for you to demonstrate the excellence of the service that ERC support staff provide to center faculty.

Tips: Don't make the faculty start from scratch every time you prepare an annual report. Start by gathering what you know already, and ask them to update that. (And be sure to give all of them copies of the final product - with enough lead time before it is sent to NSF that major errors can be corrected.) Get to know their secretaries and other assistants; these people are VIPs in your administrative network. Use a form and a collection process that you can easily update and, preferably, distribute electronically.

Participating home departments and central service offices already gather much of the information you will need, so don't reinvent the wheel! For example, check to see if you can pull grant information for your faculty off the central computer at the sponsored research office. You may need to make a special report request, but this should save you a lot of time in the long run. Other information resources not to overlook include:

- department CV files for all tenure-track faculty;
- your own research reports and newsletters (make sure the ERC has a schedule for these communication vehicles; gather information on publications, graduates, and new personnel regularly, as part of the information collection process); and
- travel authorization documents (these documents give essential information on faculty interaction with companies and other universities).

You will need a systematic process for capturing and entering all of this information into your ERC database(s) in a timely, routine manner.

#### 6.7.1.6 The NSF Annual Report

Develop a timetable and a standard operating protocol for this annual effort; define responsibilities well in advance of deadlines! Set up templates (and style guidelines); distribute and collect text electronically. Obtain a scanner; avoid re-keying information. Be sure the center office has appropriate software to coordinate different text, tables, graphs, and charts. Consider keeping an "Annual Report in-box" (in hard copy as well as on your Web site) all year long; encourage ERC personnel to contribute useful information (e.g., copies of newspaper articles, announcements, et al); this should also be useful in your general communications such as newsletters.

As the center prepares the different sections of the report, create a text "tag" for incomplete sections, with instructions and a brief statement on what information is still needed and who is responsible for that information. The tag should be noticeably different in font size/color in order to be distinguished from the rest of the document for easy removal. Ideally, the timetable for preparing the Annual Report should be set to allow time for the first completed draft to "grow cold" before final editing. Good luck!

Tips: Some centers use an e-mail template containing information that will be needed for the report. This request goes out to faculty and researchers frequently (every week, month, or quarter, depending on what works best for the group). They simply fill in the form and e-mail it back. All the information is then compiled into one file that can be returned to them for confirmation before the Annual Report is completed. You might also consider having a staff member visit each faculty member personally, prior to compiling the Annual Report, with updated information gathered during the year and any special instructions.

The data for the Annual Report flows from the center's database(s). Review the report requirements thoroughly to be sure you are collecting and organizing information appropriately to meet the requirements.

#### 6.7.1.7 The NSF Indicators Report

One person needs to coordinate this effort; this will probably be your job as the Administrative Director and liaison to NSF. Design your information system with the Indicators in mind. Document your work; keep a record from one year to the next of how you counted things. Gather information continuously, systematically. Ask your Industrial Specialist and Education Coordinator to be responsible for appropriate tables, however, it is your responsibility to make sure the center has the backup documentation. Decide how you will determine "best examples" of research and education accomplishments (sometimes known as "nuggets", or most important developments). A scrap book of media releases and/or newsletters on the ERC's accomplishments may be a good source of such "nuggets".

In 1996, for the first time, the Indicators Reports were submitted online to NSF by ERCs via a web-based system hosted by NSF. The Indicators database system is now maintained by a contractor (Quantum Research Corporation). Although the system has been refined since going on-line, it has not changed the nature of information required by NSF. User interface developments to the database will continue.

#### 6.7.1.8 Information Gathering via E-Mail

Make good use of e-mail. Generate a common ERC e-mail directory and a set of group aliases; share them across the center via your administrative server. Assign someone to maintain this file, and alert your people when changes have been made. Examples of helpful group aliases include: all ERC personnel; all faculty associated with the ERC; graduate students; undergraduate students; administrative support staff; and program or thrust leaders.

Individual personnel are able to set up private archive files for e-mail. It may also be useful to set up standard e-mail files (or "mailboxes"). For example, your center might utilize a mailbox for the Annual Report, one for conferences, newsletter information, Indicators, and other job-related information.

#### 6.7.1.9 Finding the Computer Expertise the Center Needs

Currently, existing ERCs are managing to find this help in a wide variety of ways. For some centers, computing is part of their mission, and they can draw upon faculty and student expertise within the ERC. Others must hire, train, or borrow such expertise. While most ERCs have LANs (local area networks, with one to twelve internal servers), there does not seem to be a consistent pattern to staffing solutions. This is an area that is changing very rapidly, and there is no single right way to proceed. You will want to keep an ear to the ground for developments within your institution and in participating departments. Obviously, someone should be assigned to monitor changes in available technology and to make recommendations periodically to the center on purchases and upgrades. Sometimes you can share specialized resources and expertise with the departments.

Tip: Do not assume that you have to be the center's computer expert. Find out where technical information and expertise are available in your institution. Don't resist the constantly unfolding changes in information technology--embrace them to help you fulfill your goals.

#### 6.7.1.10 Managing Your Information System

You will need a center policy on the use of unauthorized software, virus checking, and frequency of required password changes. It is likely that individuals within the center will want to share information electronically via internal servers (i.e., a LAN). This immediately raises management and security issues to be addressed. It is wise to draft a specific set of expectations for the person identified as the LAN manager. You may also wish to explore the use of "firewalls" to preserve the integrity of your information from external network users. The central computing office at your home institution should be able to help with these issues.

### 6.7.2 Communication

#### 6.7.2.1 Communication Within the ERC Community (and Beyond)

Teamwork is essential. You will want to be sure that staff working on technical reports and newsletters are coordinating closely with administrative and data management personnel. These may not be the same individuals.

All centers prepare technical research reports. Some ERCs fill reprint requests, and some do not. (The cost of sending reprints and other materials overseas is an issue at most centers; the center's Web page may increasingly provide a solution here.) All centers should have a newsletter, as the need for one

appears to grow with time; common practice is to publish two or three issues per year. An ERC brochure is a common need. (NSF periodically prepares a two-page, glossy "fact sheet" for each ERC, along with an overview description of the ERC Program. These flyers can be useful for marketing.) Most ERCs maintain a set of standard information materials that can be assembled into an information packet; standard items include fact sheets, faculty bios, information on equipment/lab use, and copies of recent publications. Some ERCs prepare a "public" version of their NSF Annual Report, although this is not a standard practice.

All publications indicated above can be made available to the ERC's partners through the center's web site. If publications, meetings, and reports are considered benefits to industrial partners, a secured section of the web site can be developed. While this allows instant publication of any center media as well as opportunities for on-line registration to ERC meetings, a secured site requires constant maintenance of security. Companies are not always responsive to requests to update user lists, so the AD and the industrial liaison need to work together to keep track of appropriate users from member companies.

When asked to prioritize target audiences (for whom communication vehicles and strategies are devised), ERC administrators ranked them as follows:

1. companies, including prospective members;
2. prospective students, and ERC alumni;
3. NSF and state personnel working on economic development;
4. university VIPs and participating departments;
5. other parts of the home university and other universities, including other ERCs, state legislators, and local press; and
6. national legislators, national press, the general U.S. public, and international interests.

Consider forming a communications team to oversee your publications and contribute editorial feedback. A few givens need to be considered, no matter how you approach the communications function:

1. Someone at the ERC is going to have to understand and oversee activities that depend on computer-generated graphics and desktop publishing. This now includes Web page development and conversion of documents into HTML format.
2. Producing something like a newsletter or an annual report is a time-intensive activity. You will need to plan staffing expectations realistically. You will also want to examine the timing of all ERC reports and communication devices (paper and/or electronic) and strategically stagger their distribution with major events that take place each year.
3. Your publications reflect the image of quality your center hopes to project. Quality standards need to be determined.
4. In the early years, communication will be terribly important for recruiting companies, students, and sponsors. At some point, however, you will need to evaluate the cost- effectiveness of your communication efforts. Given the limited resources and keen competition that characterize grant years 6-11, you may need to reconsider your target audiences and carefully select any mechanisms for reaching out to the general public.

Tips: Based on experience to date, we have found that ERC Directors vary considerably in how they view publicity. Some desire maximum exposure, while others find this a drain on precious time and resources. Be sure you discuss this with your Director and settle on a policy.

### 6.7.2.2 What About the World Wide Web?

It is dangerous to try to suggest any "best practices" for Internet use, as this area is changing so rapidly. While debate continues over whether or not Internet communications will entirely replace traditional forms of information collection and distribution, it is likely to play a larger and larger role. Already the Internet offers a major alternative medium for certain types and purposes of communication. Therefore, it is important to look at each type of information, determine the intended audience, and then publish and manage the materials appropriately. Every ERC ought to develop a Web site to reach a variety of audiences.

We must be careful not to get distracted by the changing "presentation technology" of the Web. While this technology will allow us to distribute more diverse forms (images, video, sound, etc.) and improve communication options, fundamental audience analysis shouldn't change. The cost-effectiveness of various strategies must be addressed. Who are you trying to reach, and what are the best ways to reach them?

Tip: Students are a driving force behind the use of the Web. Keep abreast of their opinions and capabilities and utilize them as appropriate. Be sure your Web page developer is thoroughly familiar with the full scope of the ERC's programs, so as to be able to market different programs to different audiences.

## 6.8 Event Management

Meetings play a crucial and vital part in the life of an Engineering Research Center. During the course of the year, a typical center will host at least three major events: two industrial meetings and one NSF site visit. Additionally, most centers must also manage a wide variety of smaller events, including faculty and staff meetings; small group meetings between faculty and industry researchers; orientation programs for new students; seminars; workshops; short courses; and social events.

It is important to realize that universities differ in structure and in their approach to event management. Hence, what works for one center will not work for another. However, this section provides a few guidelines to provoke your thoughts about preparations for a major ERC meeting. (See Section 5.3.2.4, "Communication with Companies," in the Industrial Collaboration chapter, for additional discussion.)

Industrial meetings serve a variety of purposes. Of chief importance is the opportunity for a two-way interaction with your industrial sponsors. This includes obtaining input from industry on the direction of research and education. NSF site visits allow a team of external industry, university, and NSF reviewers to assess the progress of the center and to provide suggestions or corrective actions to assist in the growth of the ERC. Continued funding depends, in large part, on the results of these external reviews.

Preparation for these meetings is critical. Effective internal coordination can influence the substantive outcome of a meeting. The information given below summarizes common tasks. A more detailed meeting checklist is provided as Attachment 3.

Tip: It is suggested that the AD keep a notebook on each major meeting, containing the agenda, participants list, handouts, minutes, venue information and prices, etc. In an emergency, this information can prove invaluable to others.

### 6.8.1 Before the Meeting

Highly successful events depend on advance planning. Early decision-making must involve the Center Director and other key ERC personnel. Some of the most time-sensitive considerations include these:

If you want the "right" people there, set the date early! Be sure there are no major conflicts with the ERC schedule, university calendar, major professional meetings, or holidays (don't overlook major Jewish holidays). Some industrial participants must schedule their travel plans a year or more in advance. Some conference centers book peak times two or more years ahead. Consult your NSF Program Director to set site visit dates.

Most centers have found it useful to coordinate ancillary events with their main industrial meetings; this increases attendance and saves money and time. Decide how many separate events are desired, including short courses, workshops, lectures, committee meetings, tour of facilities/labs, and poster sessions.

Encourage faculty and industry leaders to collaboratively plan the purpose/agenda for events. Be sure you know who is responsible for technical coordination (e.g., the faculty member responsible for a particular workshop).

Tip: Encourage long breaks, where participants from several thrust areas can meet together. Some of the BEST interactions happen during the breaks!

Determine who should be invited and estimate numbers. If the center sometimes pays expenses for external speakers, clarify expectations in advance. Note that NSF and industry have placed growing emphasis on presentations by students and young faculty.

Confirm the budget, including funding expectations for meals and travel. Ascertain the availability and necessity of discretionary funds for alcohol, meals, payment of honoraria, etc. Is a registration fee required? If so, keep it low! Industry resents paying twice.

Reserve meeting space, and secure advance contracts with hotels, caterers, and transportation. Outside vendors may require significant lead time, and usually have preferred and/or negotiated rates with the university. While it may be cheaper to go off campus, NSF and industry prefer that site visits be held on campus to permit access to labs and students.

Establish a planning timetable; determine the date invitations should go in the mail, and secure internal commitments to meet this goal. The assignment of tasks and a timetable (with clear internal deadlines) should be distributed to key faculty and staff, in writing.

Logistics to be considered include: meals; handout materials; supplies needed (including special paper stocks, signs, etc.); audiovisual equipment; transportation requirements/contracts needed; a firm

deadline for confirming speakers and final agendas; and a meeting date for last-minute briefings to staff.

### 6.8.2 During the Meeting

Most centers have found written checklists to be invaluable. No matter how well you plan a meeting, something unfortunate and unexpected is bound to happen! You will laugh about these "horror stories" later, but their inevitability reinforces the need for good planning before and after the event. Plan backup systems and reconfirm all arrangements a day or two before the event. (See Attachment 3 for details.)

Tip: Collect business cards during key events. This is an excellent way to update your mailing list, including new titles, e-mail addresses, and fax numbers.

### 6.8.3 After the Meeting

Allow time for the natural "letdown" after a major event, but do plan for a post-meeting wrap-up session with your staff. Capture, in writing, the ideas that people have for next time. One strategy that has worked well is to give all of the staff three cards: Ask them to write down at least one thing that went wrong (e.g., needs to be prevented next time); something that worked especially well (i.e., should be repeated); and a question or suggestion. (As chief organizer, you may be too close to the details, and might have overlooked something that causes confusion for others.)

Do not let down your meeting momentum until all of the following have been accomplished:

- Pay speakers and reimburse faculty and staff.
- Edit and mail minutes (or other follow-up materials).
- Update databases (industry, students, etc.) with appropriate information.
- Prepare final expense report, and update budget for future events.
- File all copies of meeting information and handouts in the master files. (Trust us: you will need them!)
- Send thank you notes! Acknowledge those who did an excellent job.

## 6.9 in Summary

ERC administrators find themselves honing a unique set of skills as the center develops. You will stretch the boundaries and limits of your institutional systems, and you will challenge policies and procedures originally designed for simpler times. As the ERC matures, you will come to depend more and more on the team of people around you and on the network of professional contacts you have developed. The ERC staff you lead will need to be as outstanding as the faculty, students, and companies you serve. The pace will be fast, and change will be a constant. There will not be any simple formulas for how to organize things, because each ERC is different. Thus, we end this advice

as we began it: Know your environment--and network, network, network! If you have questions, don't hesitate to call your peers at other ERCs. Best wishes.

## ATTACHMENT 6-1

### Generic Job Description: Administrative Director

Organization: [Brief description of center.] NSF Engineering Research Centers are dynamic organizations serving industry, university, and government needs in rapidly changing high technology areas. A complex organization, the ERC has multiple missions (research, education, and service) and is accountable to multiple funding sources (federal, state, local, university, and private). The Administrative Director reports directly to the Center Director and will manage multiple fiscal years; many different sets of rules and regulations; an annual budget of \$xx million; an average of xxx full- and part-time researchers, faculty and students; and supervise a staff of xx. Administrative duties include any or all of the following areas of expertise.

**Financial Management:** Responsibility for budgeting, accounting, and reporting in order to maximize efficient use of funding, while ensuring compliance with rules and regulations.

**Personnel Management:** Hiring, supervision, and development of center administrative personnel and management of documents/human resource policies for academic, research, and student appointments in compliance with university personnel regulations.

**Information Systems Management:** Oversight of management information system and report generation process (multiple reports to sponsoring agencies, university) and response to requests with accurate and timely information in format required.

**Liaison with University/Sponsoring Agencies:** Guardianship of university and agency system requirements (federal regulations, proposal processing, etc.) and responsibility for networking with university administration and NSF to keep abreast of latest changes.

**Other Duties As Assigned:** Event management, communications, and public relations, as assigned. Some ERC administrative directors also have responsibility for outreach and/or education functions--for example, the summer REU Program.

## ATTACHMENT 6-2

### Database Files & Fields

NOTE: There is no "ideal" database structure. Suggested categories and items of information are listed below. With "fully relational" (vs. "flat") database software, you can enter common information once, and link files through these common fields. Filemaker Pro 3.0 has released a fully relational version of that software package.

### PERSONNEL INFORMATION

Name--last, first, middle (preferred or casual name)

Titles of address (Ms., Mr., Dr., etc.)

#### Home Address Info:

- Local Address/phone number
- Permanent (hometown) Address/phone number (if different)
- Emergency Contact (name/address/phone no.)
- Forwarding Address (home & employer)

#### Campus Info:

- ERC Thrust or Program Area(s)
- ERC office/cubicle no. (and building); office phone no.; e-mail address
- Alternate address, Box #, phone, fax, secretary name, e-mail
- Card/key distributions: Key no.; access code; deposit paid
- Lab access authorized?; safety regulations satisfied?; safety equipment?
- URL address: homepage & project page

ERC Employee Status : Faculty; Research Staff; Staff; Undergraduate; Graduate Student;

Postdoctoral Student; Visitor (faculty, student, etc.)

- Social security number
- Payment account and rate (and any other payroll identification codes)
- Start & end dates (may be different for university and ERC)
- Date of birth; male/female
- Marital status; spouse's name
- Promotion and reclassification history

Awards/Committees (name; year)

### STUDENT AND ALUMNI INFORMATION

Most of the same fields listed under Personnel, above

Faculty supervisor(s)

ERC start date; date left ERC

NSF/ERC Project Title and No.

ERC funding commitments made to this student; funded by (use value list)

Previous degree information (highest held--include field of study, university, degree received date)

Degree currently seeking (BS, MS, PhD--include field of study, department; degree start date, degree received date, academic advisor, thesis title)

Department & discipline

Thesis project title, and (when known) dissertation title

ERC involvement (use value list)

REU home institution & school address

Minority status; nationality; country of origin

For international students: visa status

Optional: passport no.; admission no.; I-20 & passport expiration dates

Former student status (graduated, previous visitor/postdoc, left w/o degree, etc.)

MAILING LIST (will include both organizations, and individuals)

Same name, title, home and work address information as that listed under personnel file, above.

Organization name (e.g., company; may also want a field for parent company)

Contact name (position title, full address info, e-mail, fax, phone, secretary name and phone)

Mail sort codes (e.g., campus, domestic, international; send newsletter; send annual report; vendor; other ERC, etc.)

Mail stop codes (requested no mail; bad/missing address; temp. hold; etc.)

Contributor codes (membership and participation status)

Company sort codes (e.g., prospective member; former member; ERC program and committee affiliations; ERC Board member, etc.)

Use standardized value lists for all sort codes!

University sort codes (e.g., ERC core faculty, visiting faculty, ERC program leader, member graduate faculty, key committee memberships, etc.)

Other sort codes, as appropriate (NSF staff, ERC alumnus, high school teachers, State legislator, media contact, former REU, etc.)

Note--it is useful to systematically transfer ERC graduates from the student file (if it is separate) to the ERC main mailing list. Send them mail to keep in touch.

## FINANCIAL

These requirements will vary considerably, depending on your university and ERC systems. (See Section 6.4, "Financial Management.") Files will include:

INTERNAL ERC CHART OF ACCOUNTS (may serve as the foundation of your system, if you are using a database in addition to spreadsheets.)

### REVENUE and/or GRANTS/AWARDS

Fields needed include:

- Account codes (e.g., Fund, Unit code, account number, etc.)
- Principal investigator or manager responsible for this account
- Sponsor (source of funds for this account)
- Title on this account
- Thrust associated with this account
- Project codes (if appropriate)
- Type of affiliation this sponsor has with center
- Award amount
- Start date/end date
- Contract/grant # and type
- Reporting requirements
- Administrative and technical contact
- Budget restrictions and conditions

BUDGETS (amount per account number and period)

PURCHASES (see capital equipment file, below, for sample fields)

### EXPENDITURES (CURRENT AND HISTORICAL)

Various levels of detail may be needed, including account, sub-account, expense code (e.g., fringe, lab supply, phone, etc.)

### INVOICES

When invoicing for industrial memberships, fields may include:

- Organization name, official membership start date
- ERC program affiliation(s), by year (they change)
- Payment status; payment amount; in-kind notes
- Invoice month; payment due date in effect
- Repeating fields:
  - Check date, check amount, received date, deposit account no.
  - Invoice date, invoice no., amount, type (1st, 2nd, etc.), date paid.

FUND TRANSFERS (from and to accounts, purpose, date, notes)

### EQUIPMENT PURCHASES

Equipment group; facility  
Item, catalog no., quantity, price  
Discount notes  
Purchase order no.; account numbers charged  
Document date  
Vendor info (name, no., address, and phone, if not kept centrally)  
Ship to information  
Special ordering instructions  
Authorization limits, by fund; authorization date  
Actual expense, by fund group and account

#### AUTHORIZED TRAVEL

Name  
SSN  
Authorization document number  
Account(s) charged  
Departure date  
Return date  
Airline  
Flight #  
Originating airport  
Destination airport  
Purpose  
Business contact, address, phone, fax  
Hotel name, address, number, fax  
Notes

#### COMPUTER USER ACCOUNTS (LAN management; security required)

User name  
Supervisor  
User ID--login ID  
Start date/Expiration date  
Created by  
Delete date  
Deleted by  
Status (e.g., ERC employee; ERC student; other)  
Equipment used (PC, Mac, Sun, Intel, etc.)

#### ROOM RESERVATIONS

Name  
E-mail  
Room reserved  
Reserve date  
Start & end times  
Number of people  
Group/topic  
Required equipment  
Date submitted  
Date canceled  
Notes

#### INVENTORY

Name of item; brief description of item  
University inventory number; asset inventory no.  
Special property ID/fabrication code number (if any)  
Vendor; purchase order no., date, and amount  
Manufacturer; model number; serial no.  
Warranty information  
Maintenance contract(s) held (need contact info, here or in Mailing list)  
Maintenance notes/record (with dates)  
Lease start/end  
Original cost (you may also need approved amount; donated amount; discounts)  
Date received; date disposed of  
Explanation of use  
Location (where item is)  
Receipt on file: used if equipment is not located on-site, in ERC space  
RAM (for computers in the inventory)  
Number of users on license (for software in the inventory)  
License no. (for software)  
Notes

## ATTACHMENT 6-3

### Checklist For Event Preparation, General

#### ADVANCE PREPARATIONS:

Set date(s) for this meeting (avoid major conferences in your field, holidays, etc.)

Determine separate events involved and develop a master schedule

If this is a complex event, you may wish to develop a standard "shell" for each individual event, showing start and stop times, common meal or break periods, etc. If this is done, be sure it is sent to all event coordinators as early as possible.

Secure brief description for each event planned and be sure to...

Identify coordinator(s) for each separate activity

Confirm any special funding promised to event coordinators

Determine who should be invited

Estimate numbers expected, and other key resource statistics: attendees per event; # of separate events; meals and breaks; # of separate agendas needed; sets of minutes to be taken

Reserve meeting space

Secure contracts with area hotels

Prepare advance advertising copy (e.g., technical reports, newsletter, public ads)

- Include dates, titles, brief descriptions and any essential logistical info.
- Place advertisements early!

Determine date for formal invitations to go in the mail.

Prepare and circulate planning timetable (with deadlines) for faculty and staff.

Determine how to handle meals:

- Will ERC charge for some expenses?
- How many students should be invited to meals, and how? Who pays?
- Do we want to use meal tickets, no screening/other for meals?

File alcohol permits (cash bars work well.)

Secure agendas from program leaders and coordinators

- set deadline for receipt of draft agenda
- set deadline for receipt of final agenda(s)
- establish deadline when speakers must be identified; include info needed on speakers (e.g., social security number and address for external speakers)

Invite and confirm speakers

Prepare formal invitations and RSVP forms, including map and parking/hotel information

Determine, draft, prepare & copy all handout materials, including:

- any general logistical info and restaurant guide needed
- overheads
- packets
- any info booklets needed (e.g., ERC student resumes; participant list)

Determine food needs; order and confirm head counts/arrangements as needed.

Meet with hotel staff re arrangements. Give vendors six weeks notice; be sure to observe their deadlines for final head counts. Plan for vegetarian and other special diets. Provide a variety of food, including breakfast and reception food, that can be eaten standing up. Lunch items should be non-sleep-inducing.

Determine whether special temp help is needed. If so, where and for what?  
Hire; schedule; supervise; pay.

Order regular and special supplies.

Prepare purchase order documents for duplicating and other special work

Confirm that all required updating to mailing list is current/run labels: determine sorts required for labels, based on who is to be invited

Draft and mail special invitation letters

Prepare final schedule and circulate  
Update as major changes occur and process continues.

Signs ordered, made, and picked up:  
Workshop titles; company table signs, general directional signs.

Determine AV needs; order and confirm.  
It may be desirable to arrange/hire special AV help; arrange AV training session for staff. Have extra AV available at ERC for emergencies.

Contact special events and grounds personnel, if an outside event.  
(Avoid sprinklers being on, construction, etc., during the event.)

Update company acknowledgment board and other display cases.  
Determine whether or not any special displays or videos are desired, including who will be responsible for same.

Receive and route/handle RSVPs as they are received

Enter data into RSVP database

Finalize staff assignments, including advance prep; registration; event staffing; minutes; clean up and filing.

Head count reports distributed (in advance of the meetings)

Attendance list run and copied

Name tags prepared

Overheads completed, copied and delivered to correct individuals or supply boxes.

Buy wine, alcohol and other special and/or last-minute supplies  
Note that this often requires available cash and a car, with ability to wait for reimbursement; be careful who you assign this to.

Confirm final head counts, and call in meal counts/confirm space assignments

Hold a staff meeting just before event begins, for last-minute info and instructions

Assemble supply boxes (for each event and registration desk)

Tip: Some ERCs keep standard supply boxes for each advisory committee in storage, updating them immediately after each major event. Do these as early as possible.

Move all of the necessary supplies to the appropriate rooms

Deliver last-minute info/instructions to participants

Assemble and deliver last-minute info packets to hotels, for out-of-town guests.

#### DURING MEETINGS:

Register guests.

Tip: a portable computer and printer, on-site, is useful. Load your RSVP data on machine, along with your name tag program.

Circulate and meet with guests

Tip: Be sure your Industrial Liaison Specialist has given special, last-minute lists and briefing sheets to your Director and faculty.

Staff each separate event

Set up rooms; check on/arrange food; check AV; etc.

Minutes taken.

Tip: Assign both a staff member and a knowledgeable student to take minutes. The students will catch technical details others miss.

Record actual, final head counts. (Attendance always differs from the advance counts.)

Double-check rooms as meetings occur (be sure staff, food, AV, supplies show up; look for problems; be sure someone checks room after each event, for cleanup).

#### AFTER MEETINGS:

Pay speakers; reimburse staff for out-of-pocket expenses.

Minutes edited and mailed. Set a deadline; be prompt with follow-up!

Follow-up with participants, as desired/needed.

Update mailing list and student databases, based on new info received

Company logs updated based on activities and new info received

Follow-up evaluation meeting with staff. Write down ideas for next time!

Prepare final written report, and be sure a copy of all critical materials (including handouts and overheads) get into master ERC files.

Thank you's sent

Final budget report on meeting expenses

Clean up and filing

Additional items for company-university workshops

#### BEFORE THE MEETINGS:

Secure revised student lists from each program leader and/or PI; update student database that will be used for student invitations.

Confirm that all updating to mailing list is complete/current:

- Confirm/revise Advisory Committee and Board lists
- Review staff and faculty listings for terminations/additions
- Review VIP listing for changes
- Determine sorts required for labels, based on who is to be invited
- Will lists, by company, be desired, so that Advisory Committee members can be asked to update?

Arrangements for special small group meetings

Follow-up calls to industrial invitees, in advance of the meetings

Faculty briefings (by Industrial Liaison person)

Assemble Advisory Committee packets

Additional items in advance of a poster session; an annual ERC Industrial Advisory Board Meeting; and/or an annual program review for each thrust group.

#### BEFORE THE MEETINGS:

Gather/update lists of researchers, faculty, and students by project/program area (for program review books, and to update appropriate databases)

Update ERC graduate/alumni information (including database)

Assign production of individual program review books; establish timetable for production (and determine number of copies needed of each book)

Determine agenda (and meeting space) for Board meeting and dinner

Determine ERC overheads needed for various events, and assign production

Make arrangements for poster session

- Determine students to present (ask program leaders); if using technical consultant, arrange for this person's help; arrange for display space and tables; have poster boards checked and restored as needed; order supplies

Arrange caterer for poster session buffet dinner

Will there be any meetings of other special groups (space; agendas; staffing)?

Make arrangements for the new NSF requirement for a private lunch with the faculty and site visit team members.

Additional items in preparation of NSF Site Visit:

Confirm dates with NSF Program Director

Coordinate hotel arrangements for Site Team with both the hotel and NSF. While team members need to make their own reservations (due to NSF reimbursement policy), you may need to reserve a block of rooms in advance to reserve space at the required government rate!

Hold a dress rehearsal. When/Where? Get notice out.

Prepare a site review (viewgraph handout) book.

Who will serve on Site Review Team; circulate background info to faculty

How many computers and printers will Review Team need? Is there a photocopier near the report-writing room?

Have a well-stocked supply box! Include extra extension cords; site team members will arrive with laptop computers and need access to power outlets.

Remember that the Site Review team needs breakfasts and lunches, even on report preparation day.

## Glossary

**Accrual accounting:** The process of recording an expense when it occurs, rather than when it is paid.

**AD:** Administrative Director

**A21:** Circular A21 (from the Executive Office of the President, Office of Management and Budget) defines which costs are allowable as charges to contracts and grants.

**CASB:** Cost Accounting Standards Board, details federal guidelines for allowable costs to federal grants and contracts.

**Cooperative Agreement (NSF):** Type of award that may be used when the project being supported requires substantial agency involvement during the project performance period.

**Co-PI:** Co-Principal Investigator

**Cost Sharing:** Financial contribution by the grantee. More common to research grants; a form of matching.

**CRADA:** Cooperative Research and Development Agreement; may be used by federal laboratories.

**EEO/AA:** Equal Employment Opportunity/Affirmative Action

**E-mail Aliases:** A file on your computer (or server) that contains the e-mail addresses of groups of people with common interests or organization to whom you regularly send electronic mail.

**ERC:** Engineering Research Center

**Facilities & Administrative Costs** (also known as "overhead" or "indirect costs").

**FEDIX:** An on-line federal database with e-mail service targeting research and education funding opportunities.

FEDIX  
555 Quince Orchard Rd.  
Suite 360, Gaithersburg, MD 20818  
phone: (301) 975-0103  
<http://web.fie.com>

**Fellowship:** An award made directly to an individual in support of specific educational pursuits; not an employee. (Traineeships differ; check award conditions on training grants for service and/or pay-back requirements.)

**Fixed-Price Contract:** A contract providing for a set lump sum payment upon satisfactory performance of the terms of the contract.

**FTE:** Full-time equivalent (e.g., two half-time employees represent one FTE).

**Fund Accounting:** The accounting system used by the federal government and some universities to identify revenues and expenses according to the source of funds. Separate records are kept for assets donated to an organization and restricted by donors to certain specific purposes or use.

## GPG: NSF Grant Proposal Guide

**Grant:** Type of award under which NSF agrees to provide a specific level of support for an initial specified period of time, with a statement of intent to provide additional support of the project for additional periods provided funds are available and the results achieved warrant further support.

**Indicators Report:** Report required by NSF from all ERCs, due on or about the same time as the Annual Report, for reporting tangible measures of financial activity, personnel utilization, industrial collaboration, technology transfer, and outreach. Utilized by NSF to compare centers in reporting to congressional and other bodies.

**In-Kind contribution:** A service or item donated in lieu of dollars.

**Internet:** An integrated system that links computers (and organizations and persons) around the globe. Through this system, information can be sent and received electronically. A loosely organized international collaboration of autonomous, interconnected networks, supporting host-to-host communication through voluntary adherence to open protocols and procedures defined by Internet Standards, typically based on the TCP/IP protocol suite.

**LAN: Local Area Network--**A collection of equipment, connected via a computer or special "server," to meet the specialized needs of the organization that creates it. Allows electronic transmissions between computers and peripherals such as printers. May be connected to other, external networks (e.g., the Internet).

**Matching Funds:** Financial contribution by the university required by a granting agency as a condition for receiving a contract, grant, or award.

**MIPR: Military Interdepartmental Purchase Request.** Used to transfer funds between agencies (e.g., to the ERC via NSF).

**NACUBO:** a professional organization.

National Association of College and University Business Officers  
One Dupont Circle, N.W., Suite 500  
Washington D.C. 20036  
(202) 861-2500  
<http://www.nacubo.org>

**NCURA:** a professional organization.

National Council of University Research Administrators  
One Dupont Circle, N.W., Suite 220  
Washington, D.C. 20036  
phone: (202) 466-3894  
<http://ncura.rice.edu/ncura/orginfo/index.html>

**PI:** Principal investigator on a sponsored grant.

**RFP:** Request for Proposals

**RFQ:** Request for Quotations

STIS: An on-line search system of the National Science Foundation.

Sub-contract: An agreement or secondary contract in which a third party agrees to perform some of the activities defined in a primary proposal; agreed upon at the time of submission but not consummated until after the award has been made to the organization submitting the primary proposal.

TAC: Technical Advisory Committee, an industry advisory group required by NSF for each research program or "thrust."

Technology Transfer: The transfer of intellectual property between the ERC and the private sector.

Testbed: Experimental proof of concept, technology demonstration, pre-prototype.

Thrust Area: Major research focus area(s) of the ERC.

World Wide Web (WWW or Web): A network and software system that provides hypertext access to Web address or domain describes the specific Internet location (e.g., <http://www.espn.com>) where a Web site can be found.