



U.S. Department  
of Transportation

Federal Aviation  
Administration

# Human Resource Management Planning: State of the Art

---

DOT-TSC-FA8F5-88-1

May 23, 1988

---

Prepared for  
U.S. Department of Transportation  
Federal Aviation Administration  
Office of Human Resource  
Planning and Evaluation  
Washington, DC 20591

Prepared by  
U.S. Department of Transportation  
Research and Special Programs Administration  
Transportation Systems Center  
Support Systems Division  
Cambridge, MA 02142

## TABLE OF CONTENTS

### EXECUTIVE SUMMARY

### Section 1. INTRODUCTION

1.1 BACKGROUND . . . . .	1
1.2 PURPOSE . . . . .	1

### Section 2. APPROACH

### Section 3. STATE OF THE ART

3.1 LITERATURE SEARCH . . . . .	4
3.1.1 Human Resource Planning Systems . . . . .	4
3.1.2 Manpower Planning/Forecasting Techniques . . . . .	6
3.1.3 Organizational Culture . . . . .	7
3.1.4 Implementing Organizational Change. . . . .	7
3.1.5 Deployment of New Technology . . . . .	8
3.1.6 Employee/Union Involvement . . . . .	10
3.2 PRIVATE SECTOR . . . . .	10
3.2.1 American Telephone & Telegraph Company . . . . .	11
3.2.2 Delta Airlines, Inc. . . . .	12
3.2.3 The Wharton School. . . . .	13
3.2.4 Improving the Management of Human Resources in the Federal Government Through a Private-Public Partnership . . . . .	14
3.3 PUBLIC SECTOR . . . . .	16
3.3.1 National Aeronautics and Space Administration . . . . .	16
3.3.2 U.S. Department of Labor Human Resource Plan . . . . .	18

### Appendix A - ABSTRACTS

A.1 Change Management: Basics for Training . . . . .	A-1
A.2 How to Manage Organizational Transition . . . . .	A-1
A.3 Human Resource Forecasting: A Survey of Practice and Potential . . . . .	A-1
A.4 A Distributed Parameter Cohort Personnel Planning Model That Uses Cross-Sectional Data . . . . .	A-2
A.5 Operations Management of Human Resources in the 1990s . . . . .	A-2

A.6	An Integrated Approach for Manpower Planning in the Service Sector . . . . .	A-2
A.7	Frontiers for Strategic Human Resource Planning and Management . . . . .	A-3
A.8	Technological Innovations: Case Examples and Guidelines . . . . .	A-3
A.9	Minimizing Employee Resistance to Technological Change . . . . .	A-3
A.10	Human Resource Planning: Observations on the State of the Art and the State of the Practice . .	A-4
A.11	Effective Manpower Planning . . . . .	A-4
A.12	Planned Organizational Change and Its Measurement	A-4
A.13	Planning for a Smaller Organization: A Guide for Human Resource Managers . . . . .	A-5
A.14	A Perceived Uncertainty Model of Human Resource Forecasting Technique Use . . . . .	A-5
A.15	Managing Organizational Transformations . . . . .	A-5
A.16	Human Resource Management and Culture: History, Ritual, and Myth . . . . .	A-6

Appendix B BIBLIOGRAPHY

Appendix C EVALUATION OF CONSULTING FIRMS

C.1	ARTHUR ANDERSON AND COMPANY . . . . .	C-1
C.1.1	United States Army . . . . .	C-3
C.1.2	Federal Deposit Insurance Corporation . . . . .	C-3
C.1.3	International Development Bank . . . . .	C-3
C.1.4	Marriott Corporation . . . . .	C-3
C.1.5	A Major Intelligence Agency . . . . .	C-4
C.1.6	Federal Emergency Management Agency . . . . .	C-4
C.2	ARTHUR D. LITTLE, INC . . . . .	C-4
C.2.1	Mining & Manufacturing . . . . .	C-4
C.2.2	Utilities . . . . .	C-6
C.3	ARTHUR YOUNG . . . . .	C-6
C.3.1	United States Postal Service . . . . .	C-6
C.3.2	Office of the Secretary, Department of Defense .	C-7
C.3.3.	Defense Communications Agency . . . . .	C-7
C.3.4	United States Department of Labor . . . . .	C-7
C.3.5	United States Department of Energy . . . . .	C-8

C.4	BOOZ-ALLEN & HAMILTON . . . . .	C-8
C.4.1	Design and Development of Personnel Demonstration Project: Naval Aviation Depot, Alameda, California . . . . .	C-9
C.4.2	Space and Naval Warfare Systems Command (SPAWAR) Reorganization Support U.S. Navy . . . . .	C-9
C.4.3	Redesign of Field Administration Workflow; A Major Oil Company . . . . .	C-9
C.5	COOPERS & LYBRAND . . . . .	C-10
C.5.1	Naval Air Depot Activity Group . . . . .	C-10
C.5.2	Department of the Navy . . . . .	C-11
C.5.3	Battelle Memorial Institute . . . . .	C-11
C.5.4	An Intelligence Organization . . . . .	C-11
C.5.5	Secretary of the Navy . . . . .	C-12
C.5.6	Department of the Navy . . . . .	C-12
C.6	ERNST & WHINNEY . . . . .	C-13
C.6.1	Triborough Bridge and Tunnel Authority . . . . .	C-13
C.6.2	New Jersey Department of Transportation . . . . .	C-13
C.6.3	Metropolitan Atlanta Regional Transit Authority . . . . .	C-13
C.6.4	Denver Regional Transportation District . . . . .	C-14
C.6.5	Chicago Regional Transportation Authority . . . . .	C-14
C.7	THE HAY GROUP . . . . .	C-15
C.7.1	London Regional Transport . . . . .	C-15
C.7.2	Sikorsky Aircraft . . . . .	C-15
C.7.3	Aerospatiale . . . . .	C-15
C.7.4	Shell Oil . . . . .	C-15
C.7.5	South Central Bell . . . . .	C-15
C.8	PRICE WATERHOUSE . . . . .	C-16
C.8.1	Southern New England Telephone Company . . . . .	C-16
C.8.2	Chevron . . . . .	C-17
C.8.3	International Business Machines Corporation . . . . .	C-17
C.9	TOUCHE ROSS & CO . . . . .	C-18
C.9.1	New Jersey Transit . . . . .	C-18
C.9.2	Faberge, Inc . . . . .	C-18
C.9.3	McGregor Corporation . . . . .	C-19
C.9.4	United Van Lines . . . . .	C-19
C.10	TOWERS PERRIN FORSTER & CROSBY . . . . .	C-19
C.10.1	Shell Canada . . . . .	C-20
C.10.2	Tersoro Petroleum Company . . . . .	C-21
C.10.3	United Airlines . . . . .	C-21
C.10.4	Qantas Airlines . . . . .	C-22

EXECUTIVE SUMMARY

## EXECUTIVE SUMMARY

Human resource management planning (HRMP) is a management process that seeks to improve the overall effectiveness of an organization and its people by making projections about the future, setting performance goals, and developing activities and timetables for meeting those goals. Three elements that form the basis for human resource management planning are:

- o Human Process ... individual and group values, culture, attitudes, and patterns of behavior;
- o Structure ... formal organizational systems such as organizational design, job design, internal personnel systems, and information flow; and
- o Knowledge ... individual and group knowledge of technical, administrative, and human process subjects.

Human resource management planning is a relatively new, evolving activity. The development of human resource management planning in the business world has been in response to changing market conditions and advances in technology and communications. In the review of human resource management planning practices, approaches differ in their relative role in strategic business planning, use of models, and methods of implementation. Successful strategies incorporate a comprehensive integration of business planning and human resource management planning to provide a means for projecting human resource needs and for responding to volatile market conditions.

Public sector agency development of human resource management planning largely has been in response to the current emphasis on organization streamlining and the need to accomplish more with

less resources. Forward thinking public sector agencies are integrating their changing program direction with budget and human resource management planning to positively prepare for the future. Human resource management planning emphasis has been on providing sufficient numbers of employees with the proper skill mix to minimize costly human resource imbalances.

Review of relevant literature has revealed many distinct subject areas that represent the major elements of the human resource management planning process. These elements represent the formal and structured process for a human resource planning system. The following conclusions and suggestions represent a summary of salient findings from the review of literature with regard to the FAA human resource planning effort:

- o The state of the art is in its infancy, therefore there are no standard methodologies for the FAA Human Resource Management Plan. FAA's NAS HRMP should be developed using sound planning principles, with future modifications to refine the process and incorporate new techniques.
- o FAA line managers should be responsible for human resource management planning. Human Resource staff and operating offices should support and facilitate their efforts by providing program leadership, technical assistance, direction, and program oversight.
- o FAA human resource management planning systems should be integrated with other major planning systems such as the NAS Plan, the NAS Transition Plan, Master Schedule System and annual budget submissions.
- o Human resource management planning should be participative. FAA HRMP effort should include the

development of an intra-agency task force and stress the participation of FAA regional support.

- o FAA analytical HR system requirements should specify "top-down" needs. Data input requirements should specify minimum requirements and include the involvement of first line managers.
- o FAA must consider and resolve cultural influences (en route vs. terminal controllers and AT vs. AF workforces) for the successful design and implementation of organizational change efforts.
- o FAA responsibility for change activities should be centralized in one group to carefully plan, communicate, manage, and coordinate all transition activities.
- o Deployment of new technology has significant impacts on human resource systems. FAA's human resource management planning efforts must consider new employment programs, compensation, job design and organization structure, training, and career development.
- o FAA's successful deployment of new technology in the workforce depends upon involving employees in the effort through effective two-way communications such as use of TAC groups. FAA should develop a communications strategy as part of the overall HRMP.
- o FAA employees and the Air Traffic Unions need to participate in the change effort to develop commitment and assure successful implementation.

Appendix C presents a preliminary survey of consulting firms with experience in human resource management planning. There are several well respected international consulting firms capable of providing specialized human resource knowledge to the FAA in support of the development of the NAS Human Resource Management Plan. TSC is prepared to further assist AHP-100 in evaluation and selection of potential contractual assistance.

In conclusion, the research in the state of the art in human resource management planning has revealed experiences, techniques and modeling efforts that are relevant to the FAA. TSC recommends follow-up discussions with AT&T, Delta Airlines and The Wharton School to be included in the final report.



## 1. INTRODUCTION

### 1.1 BACKGROUND

Implementation of the National Airspace System (NAS) Plan will have significant impacts on FAA human resources. The consolidation of over two hundred terminal and enroute facilities, together with the simultaneous implementation of new air traffic control technology, has the potential for creating excessive workforce disruption. Successful implementation of the independently-planned modernization activities as well as the physical consolidation of air traffic facilities requires a coordinated plan for managing FAA human resources during NAS transition.

As a result of this need, the FAA is developing a long range human resource management plan for NAS modernization. As a first step in this effort, research into the state of the art in human resource management planning was conducted over a three-week period. This report contains an assessment of the state of the art in human resource management planning based on that research effort.

### 1.2 PURPOSE

The objectives of this report are:

- a. To compile a bibliography of human resource management planning techniques and models, and summarize approaches which have potential practical applications.

- b. To identify major organizations with potential human resource management planning processes, and assess planning techniques, tools and models used in the public and private sectors.
  
- c. To survey and evaluate a list of consultants with human resource management planning experience.

## 2. APPROACH

The approach to meeting the objectives outlined in paragraph 1.2 are described below.

- a. An extensive bibliography of books, articles and dissertations on various human resource management planning issues was compiled through computer searches of six commercial data bases. The abstracts provided by the data bases were scanned to identify the most pertinent sources from the master list. These articles are summarized in Section 3, and listed in Appendices A and B of this report.
- b. Several public and private organizations with potential human resource management planning experience in such areas as introducing technological change, large-scale employee relocations, or quantitative human resource modelling were selected. Given time constraints, most fact-finding was done through telephone interviews, with one on-site visit. Findings are presented in Sections 3.2 and 3.3.
- c. A list of ten large consulting firms with experience in human resource planning was provided to TSC by AHP-100. Using a list of criteria prepared at TSC and approved by AHP-100, a survey of the consultants was performed. Findings are presented in Appendix C.

### 3. STATE OF THE ART

This section provides major findings on the state of the art of human resource management planning based on a review of relevant academic literature and industry and government experiences in human resource management planning.

#### 3.1 LITERATURE SEARCH

A thorough examination of recent (post-1980) academic literature revealed a number of distinct subject areas which are relevant to FAA human resource management issues. Subject areas around which relevant articles were grouped and reviewed are the following:

- o Human Resource Planning Systems
- o Manpower Planning/Forecasting Techniques
- o Organizational Culture
- o Implementing Organizational Change
- o Deployment of New Technology
- o Employee/Union Involvement

A detailed bibliography of the articles and papers reviewed, as well as abstracts of the most relevant articles, are appended to this report. A summary of the major findings from the literature search arranged by subject area is presented below.

3.1.1 Human Resource Planning Systems. Human resource management planning (HRMP) as a management process is still in its infancy. Consequently, few organizations have sophisticated

and refined HRMP processes in place. However, one of the key characteristics of organizations with recognized exemplary human resource programs is the integration of strategic human resource planning with strategic/business planning. Yearly operational plans are prepared using the guidance and goals set forth in the strategic plan.

At its best, HRMP is a formal and structured process which is both participatory and institutionalized throughout the organization. It is the functional responsibility of line managers with practical support from top management and human resource specialists. There are four basic steps to human resource management planning.

- a. Perform an analysis of the organization's environment (both internal and external), and determine the impacts on the workforce.
- b. Identify key management concerns for the organization and determine their impact on the workforce.
- c. Develop strategies for meeting human resource goals.
- d. Develop action plans to accomplish human resource goals.

There are a number of planning models/processes (Manzini, 1984) proposed for practical human resource management planning efforts. Most successful HRMP systems incorporate the following concepts:

- o Integration with other major planning systems;
- o Good communication channels among human resource professionals, line managers and other planning components;

- o Ability to perform contingency or "what if" types of analyses;
- o Readily usable outputs; and
- o Succession planning and other programs which facilitate fulfillment of employee career objectives and encourage commitment to the organization.

3.1.2 Manpower Planning/Forecasting Techniques. Manpower planning/forecasting represents an important element in organizational planning. Applications of forecasts include:

- o Evaluating recruitment, training and development activities;
- o Planning capital, facility and support resources;
- o Identifying employee mix changes; and
- o Ensuring adequate knowledge and capacity.

Forecasts should represent a proactive opportunity to affect the level and mix of a future organization, while pointing out potential problems. Forecasts should combine "top-down" and "bottom-up" approaches to produce an integrated effort that combines both business and human resource strategies.

Accurate skill, headcount and recruitment forecasting represent very complex tasks. A critical preliminary step in forecasting requires a clear understanding of an organization and its environment. In addition, basic assumptions regarding changes in job roles, organizational structure, markets, technology, attrition and mobility, automation and productivity must also be considered.

Manpower planning efforts should represent educational documents, graphically identifying trends, assumptions, and implications. The results should include the practical involvement of first-line managers.

3.1.3 Organizational Culture. Organizations, like people, establish personalities or identities which have come to be known as "culture". Examining culture is a new way of understanding organizations. Cultural indicators which have diagnostic value for human resource professionals include organizational usage of symbols, rituals, ideologies, language, stories, myths, relationships, and humor. Managers attempting to implement organizational change, need to understand how that change will affect organizational culture. If a change is not compatible with the organization's culture, management has two choices: 1) modify the change so that it is more in line with the organization's culture or 2) change the organization's culture. By far, the latter is the more difficult task.

3.1.4 Implementing Organizational Change. Change management is a three-step process:

- o Define the "future" (where the organization is expected to be),
- o Define the "present" (the current state of the organization), and
- o Plan the transition activities from the present to the future.

Effective management of organizational change requires careful planning and communications. Successful change efforts are characterized by the following:

- o Top management support as demonstrated by participation in the change efforts, and provision of adequate resources;
- o One individual/organizational entity responsible for managing the change effort in order to coordinate all transition activities;
- o Adequate authority delegated to the "change manager" to convey the importance of the change effort and to resolve conflicts and direct efforts throughout the affected organizations;
- o Participants engaged in some of the decision making activities that effects change or identifies how the change would be implemented;
- o Adequate resources to accomplish change activities;
- o Comprehensive planning activities which are systematic, meaningful, participative, and monitored;
- o Comprehensive communication activities which keep employees informed of the change activities and provides feedback; and
- o Consideration of organization culture issues and their impact on change strategies.

3.1.5 Deployment of New Technology. Deployment of new technology in the workforce is occurring with increasing frequency, but for the most part, the effects of technological innovation on people in the workplace have yet to be seriously addressed. However, implementation of advanced technology is known to directly affect the following human resource areas:



- o Employment patterns... There will be an increased need for workforce flexibility over a wide-range of skill areas and ability to respond to unpredictable workloads. Organizations need to develop a pool of highly skilled workers to meet shifting demands. Part time employees and contractor support can meet this requirement.
- o Skill patterns... As automation performs more of the tasks formerly performed by humans, organizations risk the loss of certain necessary skills needed to perform planning and managing functions because they are no longer routinely developed on the job. This can be avoided by redesigning jobs to encourage the retention and expansion of technical knowledge and skill.
- o Employee training... In addition to any knowledge and skill training required by new technology, training can be used to help implement change.
- o Job structure... Changes in job design can impact the classification and qualification requirements resulting in changes to recruiting programs and pay structures of the organization.
- o Organization structure... As the job of the individual employee changes, the structure of which it is a piece will change as well.

The above human resource areas need to be examined and incorporated into human resource management plans associated with major technological change. However, successful deployment of new technology in the workforce depends upon effective communications and efforts to engage employees in the change

through participation. Experiences of AT&T (London and MacDuffie, 1987) in this area are worthy of follow-up through interviews and onsite visits.

3.1.6 Employee/Union Involvement. Unions seek to protect employees from the potential threats of technological change, e.g., job loss, however, most unions will understand the necessity of new technology in enhancing an organization's competitiveness. Unions need to be fully informed of the change effort and activities and should be allowed to participate in decisions regarding technological change and implementation even when there is no obligation for collective bargaining. As key players in an organizational change process, unions need to be committed to change in order for the change to be effectively implemented. The way to gain that commitment is through participation in change decisions and activities which affect their constituency.

### 3.2 PRIVATE SECTOR

Discussions were held with major organizations to identify potential human resource management planning processes. Telephone interviews were performed to learn of human resource planning techniques, tools and models used in private industry. This section will present preliminary results of discussions with private corporations (American Telephone & Telegraph Company and Delta Airlines Inc.) and academic programs (Wharton School). A study identifying exemplary private/state/local sector human resource management practices is also reviewed. Additional organizations were identified (Hewlett Packard Company and the Motor Vehicle Industry/United Auto Workers Union negotiations) but could not be reached within the current time frame. Preliminary findings, by organization are presented below.

3.2.1 American Telephone & Telegraph Company (AT&T).

Dr. Jerry Maurer, Director

Dr. Simon Krieger, Education

Human Resources Strategy Group, Tel. 201 221-3608/5766

Basking Ridge, NJ

AT&T's Human Resources Strategy Group prepares, as part of the overall business strategy, a human resource management plan. The purpose of the human resource management document is to produce workforce data requirements in the upcoming five year period and to give guidance to managers and human resource staff to plan and prepare new programs. The Human Resources Strategy Group also works with unit managers to develop unit specific plans regarding education and training issues, demographics, skills and overall workforce needs.

The Human Resources Strategy Group's approach to human resource management planning is broad in scope and begins with a focussed discussion of AT&T's business strategy. Specific questions are asked regarding the corporate mission and values, forecasts of societal trends, and profiles of the AT&T workforce as well as the labor market. Human resource needs are driven by these decisions. Human resource planning examines the skills needed during the next five years, evaluates the present AT&T workforce, and then assesses the transition to bridge the human resource gap.

The Human Resources Strategy Group does not employ any modeling techniques in their analyses. They have a good understanding of the KSAO's for each of their critical jobs as well as other information about competencies required for various positions. Their internal studies indicate an increased need for leadership skills at all position levels, including secretarial positions. Their process for calculating future skill requirements is part

quantitative, using demographic data, and part analytic, using job competency data.

AT&T performed a survey of human resource planning techniques approximately one year ago. Their findings indicate no refined state of the art techniques, but rather an evolving process. AT&T's involvement with human resource planning is on a daily basis and is a critical element of their overall strategic business plan.

TSC is pursuing a follow-up visit with AT&T's Human Resources Strategy Group to expand on initial discussions. However, AT&T is concerned about revealing human resource practices which might effect their competitive advantage.

### 3.2.2 Delta Airlines, Inc.

Nick Parker, Director Personnel Relations  
Russ Heil, Senior Vice President - Personnel  
Tel. 404 765-2138  
Hartsfield Atlanta International Airport  
Atlanta, GA

With the merger of Western Airlines into Delta on April 1, 1987, approximately 11,500 Western personnel became Delta employees. The transition to Delta workforce for Western personnel involved a major change in corporate philosophy and operating procedures. Specific impacts included the relocation of approximately 1,200 families, in addition to retraining a majority of the workforce.

Delta's Office of Personnel Relations has extended an invitation to TSC to visit for further discussion of Delta's human resource transition plans with Western Airlines. TSC has prepared a list of questions for this proposed meeting.

### 3.2.3 The Wharton School.

Dr. Arie Schinnar, Director, Policy Modeling Workshop

Tel. 215 898-8213

Philadelphia, PA

The Policy Modeling Workshop has successfully implemented mathematical models and computer methods for the development of policy decisions within the public and private sectors. Examples include human resource planning, implementing computer-based models for planning and forecasting recruitment, advancement, and staffing needs in organizations. The models developed are decision support systems which address strategic goals or problems for individual organizations. Their process for implementing models is performed in phases, beginning at the top of the organization, with modules addressing lower levels of management.

Their current work activities include developing a dual personnel system for the UNISYS Corporation which incorporates strategic business planning (training and recruitment), along with personnel actions (succession planning and micro management). In addition, current efforts are ongoing with the Department of Army to develop state of the art techniques in workforce composition projection models in the evaluation of reenlistment decisions and the management of personnel movements from reserve to active status.

Dr. Schinnar possesses a very good understanding of the importance of identifying planning assumptions for the assessment and development of system requirements for any quantitative modeling techniques. Development of systems requirements can be summarized under the following steps: 1) Inventory existing systems; 2) Identify human resource issues and decisions within affected organizations; 3) Specify general system parameters;

4) Develop input requirements of the model; 5) Assess existing systems in relation to new input requirements; and 6) Resolve any data overlaps or deficiencies. In the specification of system parameters, care should be taken to not overspecify data requirements for the model. Only minimum requirements should be specified; examining that data which is used on a regular basis. Automation of a modeling technique should reduce any redundancies of data usage within an organization. A follow-up visit to Dr. Schinnar is scheduled for Thursday, June 9, for further discussion of quantitative modeling processes.

#### 3.2.4 Improving the Management of Human Resources in the Federal Government Through a Private-Public Partnership.

A Study of Private Sector/State and Local Government Personnel Operations (PSS) was sponsored by the President's Council on Management Improvement (PCMI) to identify and analyze exemplary private/state/local sector human resource management practices and to implement some of these practices in the Federal sector on a pilot basis.

The study found that the private sector, like the Federal sector, is confronted with significant human resource issues, such as over and under employment, low productivity and burdensome red tape which have necessitated a more comprehensive and systematic approach to managing human resources. The study also found some innovative private sector practices which can be applied to the Federal sector with resulting benefits of better budget and personnel justifications, optimal skill mixes, justification of training and development needs, and improved employee communications.

Three themes were found to exist in companies with exemplary

human resource management practices:

- o Successful organizations are very responsive to change;
- o Successful organizations strategically plan for their human resource needs and cultivate innovative practices; and
- o Successful companies create strong corporate cultures through management development programs.

The study created a number of "prototype" human resource practices for pilot test implementation in selected Federal agencies. Based on the experience of seven "host" agencies, the study identified key factors to successful federal implementation of new and improved human resource management systems:

- o Support from executives and managers;
- o Clear, reinforced agency management commitment;
- o Appropriate organization location of the change effort;
- o Readiness of the organization for change; and
- o Willingness of an individual or group to seize the opportunity to instigate management reform.

There are a series of reports on the efforts of this study which we are in the process of obtaining. A number of private/public sector organizations referenced may warrant additional follow-up. These companies include AT&T, Bank of America, Sara Lee Corporation, American Express, State of California, Ford Motor

Corporation, Exxon, IBM, and Port Authorities of NY and NJ.

### 3.3 PUBLIC SECTOR

Preliminary investigations of academic literature identified a few public sector agencies involved in human resource management planning. This section summarizes public sector experiences in human resource management planning.

#### 3.3.1 National Aeronautics and Space Administration (NASA).

Ray S. Mayfield, Office of Human Resources and  
Organization Development  
Tel. 202-453-8686

Following the Challenger space shuttle disaster, NASA's Administrator commissioned a complete study of NASA operations and organization. This Phillips II study identified a number of issues which have significant impacts on NASA human resources and recommended that NASA develop a comprehensive human resource management plan.

The principal issue affecting NASA human resource management is the changing mission of NASA from a project based organization to one of ongoing operational programs such as the shuttle program and the space station. This change impacts organization structure, management style and practices, workforce characteristics and overall organization culture in profound ways. Other human resource issues include the growing number of contractor personnel in relation to the decreasing number of federal personnel, the changing characteristics of the workforce, and the impacts of a federal personnel system which is not very responsive.

NASA's Office of Human Resources and Organization Development



began working on this issue in earnest towards the end of 1987. To date, they have examined the extent of human resource planning activities agency-wide; assessed state of the art processes and made recommendations on a course of action. A draft report was issued April, 1988, that indicates state of the art human resource management planning is in its infancy. Few organizations have comprehensive planning processes and fewer yet have workforce modelling components. Many organizations are doing some aspects of planning and the more sophisticated efforts involve integrating human resource plans with strategic business plans. State of the art processes include systematic succession planning; workforce composition models; forecasting; and long range environmental outlooks.

NASA has established a Human Resources Council comprised of all the Associate and Assistant Administrators and Center Directors to review and study human resource issues and set policy. One major function of the group is to develop a strategic Human Resources Management Plan consistent with the agency's strategic plan. This document will provide guidance to the Headquarters human resource staff offices for developing specific programs to meet the goals and objectives expressed in the strategic plan. Similarly, operating human resource management activities will use the Plan to guide their activities in providing human resource services to the different operating segments within NASA.

The first meeting of the Human Resources Council was held May 13, 1988. The agenda included a discussion of the Human Resources Plan, its purpose, objectives, and proposed structure. To date no decisions have been made as to how NASA will proceed.

### 3.3.2 U.S. Department of Labor Human Resource Plan.

As part of the President's Council on Management Improvement, private and public sector organizations worked together on a project called " Improving the Management of Human Resources in the Federal Government Through a Private-Public Sector Partnership". Outstanding private sector human resource management practices were prototyped in Federal agencies to determine if they produce the same effective results when transferred to the Federal environment. The Department of Labor (DOL) volunteered to participate by developing a human resource management planning prototype which was patterned after the human resource management planning systems at AT&T. (PCMI had developed a prototype human resource management planning process based on human resource management plans from Consolidated Food and Port Authorities of NY and NJ; however DOL found AT&T's approach more transferable to their environment.)

The objectives of DOL's Human Resource Plan were to:

- o Ensure hiring, development and organization structure support DOL's mission, program and budget objectives;
- o Avoid costly human resource imbalances by controlling hiring, use and attrition over the long term;
- o Provide a continuous supply of high-quality employees;
- o Support EEO; and
- o Ensure managers plan and manage human resources effectively.

Each agency head was responsible for developing and implementing individual human resource management plans. The human resource

staff offices provided leadership, direction, planning tools, and technical assistance in support of their efforts.

DOL incorporated several common features from successful private sector human resource management planning systems. These include:

- o Integration with other planning and budget processes so that one process produces input for other resources;
- o Establishing timetables to develop plans in a systematic way;
- o Designing plans for short and long range periods;
- o Permitting flexibility for dealing with newly emerging issues;
- o Forecasting resource requirements for program and budget submittals;
- o Utilizing demographic data from within and outside the organization;
- o Creating a participative process; and
- o Establishing an oversight mechanism to evaluate effectiveness and make adjustments.

DOL found the key factors to developing a human resources management plan are strong management support, a good understanding of how external factors, i.e., legislation, affects resource allocations, and centralized technical support to insure successful implementation.

At DOL, the most important factor in successful implementation was the Secretary's enthusiasm and strong support which led to

the allocation of adequate staff time and resources for developing the program. Inhibiting factors not originally anticipated included the need for collective bargaining on certain human resource issues and the unwillingness of a substantial number of agency managers to commit scarce resources to human resource management planning. To address these issues, the performance appraisal system was used to influence managers to commit resources and communications strategy was developed to work with unions.

## APPENDIX A

### ABSTRACTS

#### A.1 Change Management: Basics for Training.

Ackerman, Linda S.

Managing an organization through change requires balancing human needs and business needs, a process that can be facilitated by proper executive training. Corporate leaders need to decide not only what to change, but also how to change it; executives need to control the processes of change and to resolve a number of issues, such as how to select a future organizational structure that meets long-term needs, how to make the necessary changes while maintaining organizational effectiveness, and how to deal with human reactions to change. Change management training should focus on the following: communicating the need for change, assessing the situation, designing the desired state, analyzing the impact of the change, organizing and planning the change, implementing the change, formalizing the new state, evaluating the change process, and monitoring or fine-tuning.

#### A.2 How to Manage Organizational Transition.

Bridges, William

Change is the act of starting or stopping something, and can be planned. Transition is differentiated from change as being the inner process that individuals in a company go through when required to do things differently than before. How this is handled makes a difference in whether the company can efficiently and successfully sustain such change. Personnel or human resources departments should have a major role in how this is handled. They should assess the change in terms of how many people will be affected, what losses these people might feel and the need people might feel to go back to something familiar. Management should understand that a well-managed transition period will save money and that clear communication is always important.

#### A.3 Human Resource Forecasting: A Survey of Practice and Potential.

Feuer, M. J.; Niehaus, R. J.; Sheridan, J. A.

A survey of human resource management forecasting literature is provided. The use of computer systems in forecasting is discussed. A survey involving approximately 100 companies is discussed. An appendix with the survey questionnaire is provided. Eight tables of survey results are included. Results

suggest that businesses are not readily using available technology in their forecasting.

#### A.4 A Distributed Parameter Cohort Personnel Planning Model That Uses Cross-Sectional Data.

Gaimon, C.; Thompson, G. L.

Mathematical manpower planning models are generally of two types, longitudinal or cross-sectional formulations. Longitudinal models require a large amount of historical data. In this paper, a longitudinal personnel planning model is solved using a distributed parameter control theory technique. The model derives optimal hiring, promotion, separation, and retirement as functions of time and a person's organizational age and grade (one's 'cohorts'). Solutions for the optimization problem are provided and examples given to test the numerical solution technique described.

#### A.5 Operations Management of Human Resources in the 1990s.

Goodridge, Mark

Based on practical experience and on a number of applied research projects into the management of technological change carried out for the Manpower Services Commission in the UK, it is shown that advanced manufacturing systems place a different set of demands upon people. Key consequences of technological trends for operations management and the ways in which they deal with their human resources are in the areas of: 1. employment patterns, 2. skill patterns, 3. training, 4. pay structure, 5. trade unions, 6. organizational structure, and 7. management style. Walton (1985) states that the effective management of advanced technology requires a movement from a control to a commitment orientation in the workplace, including such features as: 1. job design principles, 2. performance expectations, 3. management organization, 4. compensation policies, 5. employment assurances, 6. employee involvement, and 7. labor management relations.

#### A.6 An Integrated Approach for Manpower Planning in the Service Sector.

Henderson, J.C.; Krajewski, L.J.; Showalter, M.J.

Service organizations must approach the complex problem of manpower planning. Optimal units of staff, schedules and customer service must be balanced but cost minimization must also be considered. A methodology is proposed. A large central post office is the case study.

A.7 Frontiers for Strategic Human Resource Planning and Management.

Kanter, Rosabeth Moss

Many businesses are adopting increasingly sophisticated strategic planning systems for all aspects of their operations, including human resource management. However, sophisticated systems will not result in more effective human resource management unless they address increasingly uncertain environmental conditions. Businesses must become flexible in employment relations, promoting subcontracting and cross-training to alleviate problems of labor market fluctuations. Innovation must be fostered through work environments that allow local autonomy while encouraging interdependence within local units. A strategy for managing change must be developed and supported through tactical or response planning in an adaptable organizational culture. Human resource management must focus on how workers can be used most effectively, rather than on how they can be developed. Finally, human resource professionals must lobby for strong public education and worker retraining programs.

A.8 Technological Innovations: Case Examples and Guidelines.

London, Manuel; MacDuffie, John Paul

The barriers to implementing technological change in an organization are discussed. Technological changes may be resisted if change effects the nature of the work, or if the employees feel that change will result in job loss, relocation, or loss of control over their work. Two case studies of how technological changes were implemented at companies examined in order to illustrate the characteristics of change, the impact of change on the organization, preferred techniques for implementing change, and ways to intervene the implementation process.

A.9 Minimizing Employee Resistance to Technological Change.

Mainiero, Lisa A.; DeMichiell, Robert L.

Automation results in improved productivity and reduced operating expenses, but only when employees embrace the technology willingly. A survey of six companies that completed automation projects indicated that decisions to automate were typically top-down decisions, and employees' involvement consisted solely of being trained to operate the system installed. Personnel managers should be aware that automation projects often result in: employee resistance to change; the need for revised job descriptions; and new reward systems for employees, as well as the obvious training needs. These problems, and suggestions to facilitate automation projects are discussed; the suggestions include: automate slowly, encourage employee participation, be aware of job changes occasioned by the

automation, plan for replaced workers and training needs, and reward employees for acceptance and operation of the system.

A.10 Human Resource Planning: Observations on the State of the Art and the State of the Practice.

Manzini, A.O.

State of the art and the practice of human resource planning are discussed. Results of a Human Resource Planning Society conference are summarized. A detailed flowchart of strategic forecasting/planning/development and a diagram of integration of planning are provided. Development of an integrated planning system is discussed. Steps include: 1) integrate with other planning systems, 2) develop database, 3) develop a contingency analysis system, 4) supply usable data to managers, and 5) support career development. Technological changes are necessary, particularly computerization, in human resource planning.

A.11 Effective Manpower Planning.

Pakchar, P.

Applications of human resource modeling used in manpower planning are examined. A human resource model consists of staffing levels, turnover rates, job requirements, and movement limits. The formulation of a model is presented. How to interpret the results of a human resource model is presented.

A.12 Planned Organizational Change and Its Measurement.

Randolph, W.A.

The number of practitioners and scholars in the field of organization development (OD) has grown steadily since the inception of OD in the early 1960's. Based upon recent reviews of methods of evaluation in OD, a description of a method for measuring planned organizational change is synthesized. A diagnostic, reliability-tested questionnaire was used in a modified multiple-time-series research design, with a closely matched comparison organization. Data was analyzed for three types of change. Results support the theory that the method of measurement is viable for assessing the impact of an OD intervention. Thus, it provides the groundwork for developing an empirically-based theory of OD.



A.13 Planning for a Smaller Organization: A Guide for Human Resource Managers.  
Silverhorne, Colin P.

Since the late 1970s both public and private organizations have undergone a significant amount of downsizing (reductions of organizational and staffing levels). These downsizing efforts have created difficult to manage layoff situations. Five downsizing strategies are discussed in detail: (1) consider staff attrition an opportunity for change (rather than an automatic recruitment need), (2) concentrate on employee training and development, (3) estimate an acceptable level of turnover and plan for it, (4) encourage open communication throughout the firm as staffing levels are reduced, and (5) promote change as a positive and continuous force. Recognizing organizational changes as part of a continuous process is facilitated when a four-step model is analyzed. The steps in the change model are: (1) establishing a sound organizational base, (2) promoting response to change (rather than ignoring change) throughout the organization, (3) developing procedures for responding to change, and (4) developing staff flexibility. Flexibility is discussed in relation to organizational development, employee role clarification, establishment of organizational priorities, and management of organizational disruptions.

A.14 A Perceived Uncertainty Model of Human Resource Forecasting Technique Use.  
Stone, Thomas H.; Fiorito, Jack

A model is developed to explain and predict the use of human resource forecasting techniques by organizations. The model employs uncertainty theory and a previously developed model of human judgment. The forecasting technique use model predicts that: (1) moderately low uncertainty will allow the use of sophisticated human resource forecasting techniques, (2) moderately high uncertainty will limit the use of sophisticated forecasting techniques, (3) low uncertainty will accompany the lowest use of forecasting techniques, (4) large organizations tend to use sophisticated forecasting techniques, (5) scarcity of labor supplies will encourage the use of forecasting techniques, and (6) when a decision-maker's perception of uncertainty changes, so will the forecasting technique used.

A.15 Managing Organizational Transformations.  
Tichy, Noel M.

Business survival in a changing environment requires an effective strategic planning system geared to the management of change. A strategic planning matrix is presented which aligns corporate goals and strategies, organizational structure, and

human resource management with the corporate technical, political, and cultural systems requiring strategic management. Corporations must define their missions and strategies, determine who will influence mission and strategy decisions, and develop a supportive organizational culture. Organizational structure must be aligned with corporate strategies; power must be distributed and balanced across groups involved in strategy formulation and implementation; and a managerial style must be promoted to foster continuing cultural support. Finally, human resource management must match individuals to the organization's technical, political, and cultural systems through the proper distribution of rewards and career opportunities.

A.16 Human Resource Management and Culture: History, Ritual, and Myth.

Ulrich, Wendy L.

A review is presented of methods used to analyze culture, which human resource management (HRM) executives can utilize to extend their understanding of their own departments and the larger organizations employing them. The causes for the present emphasis on culture as an organizational metaphor are explored. International competition and economic pressures are used as illustrative examples. There are various organizational manifestations of culture: 1. symbols, 2. rituals, 3. ideologies, 4. language, 5. stories and myths, 6. relationships, and 7. humor. Such cultural indicators have diagnostic value for human resource management professionals. suggestions are made for alternative strategies for working with cultural realities. Human resource managements' knowledge and awareness of the concept of culture as it applies to organizations and personnel management can lead to: 1. improved employee commitment and motivation, 2. enhanced traditional values, 3. organizational change, and 4. better overall organizational health.

APPENDIX B  
BIBLIOGRAPHY

- Ackerman, Linda S. (1986, April). Change management: Basics for training. Training & Development Journal, 40, 67-68.
- Bridges, William, (1985, September), How to manage organizational transition. Training: The Magazine of Human Resources Development, 22, p28(5).
- Evans, Alastair, & Cowling, Alan, (1985). Personnel's part in organisation restructuring. Personnel Management (UK), 17(1), 14-17.
- Feuer, M. J., Neihaus, R. J., & Sheridan, J. A., (1984). Human resource forecasting: A survey of practice and potential. Human Resource Planning, 7(2), 85-97.
- Gaimon, C., & Thompson, G. L., (1984). A distributed parameter cohort personnel planning model that uses cross-sectional data. Management Science, 30(6), 750-764.
- Goodridge, Mark, (1986). Operations management of human resources in the 1990s. International Journal of Operations & Production Management (UK), 6(4), 42-60.
- Henderson, J. C., Krajewski, L. J., & Showalter, M. J., (1982), An integrated approach for manpower planning in the service sector. Omega, 10(1), 61-73
- Johnson, Homer H., & Fredian, Alan J., (1986, August). Simple rules for complex change. Training & Development Journal, 40, 47-49.
- Kahalas, Harvey, (1984). Environmental changes. Personnel Administrator, 29(3), 104-107.
- Kanter, Rosabeth M., (1983). Frontiers for strategic human resource planning and management. Human Resource Management, 22(1/2), 9-21.
- Kozlowski, Steve W. J., (1987). Technological innovation and strategic human resource management: Facing the challenge of change. Human Resource Planning, 10(2), 69-79
- London, Manuel, & MacDuffie, John P., (1987, November), Technological innovations: Case examples and guidelines. Personnel, 64(11), p26(10).

- Mainiero, Lisa A., & DeMichiell, Robert L., (1986, July). Minimizing employee resistance to technological change. Personnel, 63(7), p32(6).
- Manzini, A. O., (1984), Human resource planning: Observations on the state of the art and the state of the practice. Human Resource Planning, 7(2), 105-110.
- Oliver, Stanley, (1984), The personnel role in technological change. Personnel Management (UK), 16(7) 34-37.
- Pakchar, P., (1983), Effective manpower planning. Personnel Journal, 62(10), 826-830.
- Portwood, James D., & Eichinger, Robert W., (1986), Maintaining the corporate competitive edge: Human resource management at the forefront. Human Resource Planning, 9(4), 125-148
- Randolph, W. A., (1982), Planned organizational change and its measurement. Personnel Psychology, 35(1), 117-139.
- Rothwell, Sheila, & Davidson, David, (1982/1983), Skill deployment. Journal of General Management (UK), 8(2) 87-93.
- Silverhorne, Colin P., (1987, March), Planning for a smaller organization: A guide for human resource managers. Personnel, 64(3), 60-66
- Stone, Thomas H., & Fiorito, Jack, (1986, July), A perceived uncertainty model of human resource forecasting technique use. Academy of Management Review, 11(7), 635-642
- Taylor, B. W. III, Moore, L. J., & Clayton, E. R. (1982), R & D project selection and manpower allocation with integer nonlinear goal programming. Management Science, 28(10) 1149-1158.
- Tichy, Noel M. (1983), Managing organizational transformations. Human Resource Management, 22(1/2), 45-60.
- Ulrich, Wendy L. (1984), Human resource management and culture: History, ritual, and myth. Human Resource Management, 23(2), 117-128.
- Warner, Malcom (1986), Human resources implications of new technology. Human Systems Management (Netherlands), 6(4), 279-286.

APPENDIX C  
EVALUATION OF CONSULTING FIRMS

Part of the research for this program called for TSC to solicit information from top international consulting firms with experience in human resource development. The firms were asked to submit a list of clients for whom they had provided service in the areas of:

- a. Major workforce consolidation and/or
- b. Assisting large organizations adapt to technological change.

TSC evaluated the responses and identified those tasks which reflect experience most applicable to FAA's needs. The tasks, in condensed form, are summarized below. A comparative matrix summarizing each consulting firm's experience with major human resource management subject areas is presented in Table C-1. Within the time constraints, this evaluation represents an initial review of each consultant. The next step to complete the evaluation process would be an examination of methodologies used by the individual consulting firms, and, through discussions with their clients, documentation of the results to date.

**C.1 ARTHUR ANDERSON AND COMPANY**

Arthur Anderson & Co. was the prime consultant for human resource management for the organizations identified in the following paragraphs. The contact person for Arthur Anderson & Co. is:

Table C-1. Human Resource Areas/Consulting Firms Comparative Matrix

Human Resource Areas

Consulting Firms	Training & Development	Organization Development	Organization/Job Design	Human Resource Planning	Selection & Staffing	Personnel Research & Information Systems	Compensation/Benefits	Employee Assistance	Union/Labor Relations
Arthur Andersen & Co. c.1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
Arthur D. Little c.2	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Arthur Young c.3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Booz-Allen & Hamilton Co c.4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coopers & Lybrand c.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ernst & Whinney c.6		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hay Company c.7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price Waterhouse c.8	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
Touche Ross c.9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
Towers Perrin Forster & Crosby c.10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

John L. Morrison  
Arthur Anderson & Co.  
Boston, MA 02110  
Tel. 617 330-4000

C.1.1 United States Army. Arthur Anderson conducted a project called the "Total Army Lifecycle Personnel Project" for the Army's Chief of Staff for Personnel. This project reviewed the personnel function for the entire Army (Active, Reserves and National Guard) across the United States. Arthur Anderson recommended measures to reduce layering in the organization and to increase efficiency. During the project they interviewed over 500 people and visited all armies in the U.S., the National Guards in 14 states and various Pentagon officials. The first phase of implementation is now in progress. They are visiting sites with Army officials to explain the implementation steps required. Approximately 2 million personnel will be affected.

C.1.2 Federal Deposit Insurance Corporation (FDIC). Arthur Anderson prepared a reorganization plan affecting FDIC activities nationwide. In preparing the plan Arthur Anderson visited approximately 25 sites. About 5,000 people were affected. The plan provides for significant manpower reductions and is currently being implemented. A manpower reduction of approximately 1,500 people has been achieved.

C.1.3 International Development Bank (IDB). Arthur Anderson conducted a human resources programs study affecting the bank's 2,000 employees. The study recommended changes in organization and approach which would enable the IDB to administer programs such as insurance, health care, retirement, etc. more effectively for the bank's employees.

C.1.4 Marriott Corporation. Arthur Anderson is currently conducting a review for Marriott in which it will be addressing

their organizational approach and staffing levels with the aim of achieving greater effectiveness and efficiency.

C.1.5 A Major Intelligence Agency. Arthur Anderson conducted an analysis of the training needs of intelligence analysts, particularly as regards information systems and technology. They made recommendations for an appropriate organization and approach to deliver this training. Implementation is currently underway. The number of individuals affected and most other details are classified.

C.1.6 Federal Emergency Management Agency. Dr. Charles M. Girard of Arthur Anderson's Washington D.C. office, who specializes in work of this nature, conducted an organizational review which addressed all the operations and the complete organization of this Agency. Approximately 5,000 people were affected. The recommendations of the study were implemented and called for large-scale job restructuring and retraining.

## C.2 ARTHUR D. LITTLE, INC.

Arthur D. Little, Inc. was the prime consultant for human resource management for the organizations discussed in the following paragraphs. The contact person for Arthur D. Little, Inc. is:

Dr. Ashok B. Boghani  
Transportation and Technology Unit  
Arthur D. Little, Inc.  
Cambridge, MA 02140  
Tel. 617 864-5770

C.2.1 Mining & Manufacturing. Arthur D. Little (ADL) has provided information on their efforts for three large industrial



companies, two of them multinational, and another defense-oriented, all with varying human resource management needs.

- a. For a large, diversified international company that has several mining and manufacturing divisions, Arthur D. Little, Inc. completed the most recent of several assignments concerning the organization and location of engineering and other technical support for operating divisions, new mines, and mine expansions, and for the evaluation of properties and projects in the pre-development stage. ADL developed mission statements for major organizational entities and job descriptions for key managers. The firm provided counsel on the organization of the entire top echelon of the company, with emphasis on activities such as engineering (centralized versus decentralized engineering was a key issue), exploration, planning, and corporate development, which address the future and are particularly important for firms dependent on depleting resources.
  
- b. For a large, multinational mining and metal manufacturing company, Arthur D. Little, Inc. conducted a number of organization studies. Issues addressed were 1) centralization and decentralization issues with various facilities and operating groups; 2) staffing requirements - the division, assignment, measurement and management of key tasks - and reporting relationships; and 3) the development of unit mission statements and key position descriptions that reflect current and anticipated needs.
  
- c. A defense electronics division of a corporation asked Arthur D. Little, Inc. to evaluate its proposed reorganization of operations. ADL objectives were to compare the pros and cons of the new concept to the current operations; estimate the cost of implementing the concept; and prepare a

presentation to help explain the concept to senior division management. ADL met with managers to analyze the nature of the work being performed; the staff's skills; and achievements in product and process design, development, manufacturing and testing. ADL also examined alternative incentive schemes that would support the new organization, and tested these ideas with division staff.

C.2.2 Utilities. Arthur D. Little, Inc. recently completed an in-depth management and operations review of RCA-Alascom, the long-lines telephone utility serving the State of Alaska. This study included analysis of the management process and organization, and a review and evaluation of Alascom's personnel policies, practices, and procedures. The unique features of the company's development and setting were analyzed regarding their impact upon general elements of the personnel system, which included recruitment, staff training and management development, compensation and benefits, and key staff turnover.

### C.3 ARTHUR YOUNG

Arthur Young Company was the prime consultant for human resource management for the organizations identified in the following paragraphs. The contact person for Arthur Young Company is:

Michael Power  
Arthur Young Company  
Washington, D.C. 20007  
Tel. 202 956-6287

C.3.1 United States Postal Service. Arthur Young conducted a job evaluation and compensation comparability study of selected positions in the Postal Service for upcoming labor-management negotiations. The study required obtaining confidential employment information from private sector employers and

analyzing it using state-of-the-art job evaluation methods to assess comparability to similar benchmark positions to other industries. Methods used to support their findings were: Decision Band Method, Factor Comparison, Point Factor, and Whole Job Matching.

C.3.2 Office of the Secretary, Department of Defense. Arthur Young provided recommendations on the establishment of a performance-based bonus system to the Deputy Comptroller in the Office of the Secretary of Defense. This system was designed to operate separately from, and in addition to the existing federal merit and reward systems which were already in place. Arthur Young assisted in the development of performance measurement criteria, linking them to actual monetary awards, as a reward for performance and an incentive for increased productivity.

C.3.3. Defense Communications Agency (DCA). In preparation for anticipated advancements in the rapidly changing area of telecommunications technology, Arthur Young designed, managed and performed follow-up on a strategic planning conference for the top level staff at the Defense Communications Agency. This effort helped the Agency position itself for the managerial and organizational changes which it faced in light of new technologies. Facilitated by strategic planning consulting from Arthur Young, the DCA was able to identify some of the changes anticipated in the technology of the communications industry, and the major steps necessary to prepare and manage their adaptation, especially in the areas of human resource planning. The planning and assistance in this project was provided directly to the Director of the Defense Communications Agency.

C.3.4 United States Department of Labor (DOL). Arthur Young Company directed a strategic planning process at DOL. This effort involved top management, including the Secretary of Labor, Assistant Secretaries, and senior executives in a thorough

process of developing comprehensive goals and objectives for DOL and its senior management. Arthur Young has been involved in the project from its inception - including developing the Secretary's vision for the future of the Department, and the specific determination of milestones and timetables for implementing the Secretary's vision. Also with the firm's consultation, the DOL is instituting a tracking mechanism, which will integrate the Strategic Plan with other management controls in order to monitor the progress of the plan and make adjustments where necessary.

C.3.5 United States Department of Energy. Arthur Young designed and delivered Performance Appraisal Training for middle- and senior-level managers in the U.S. Department of Energy. Following an in-depth needs assessment, the firm designed a training program, making extensive use of videotapes, to teach participants theories upon which performance appraisals are based - communications, conflict management, assertiveness, listening, leadership, motivation, performance analysis and problem solving. The training also includes performance instruction and practice in writing individual performance standards.

#### C.4 BOOZ-ALLEN & HAMILTON.

Booz-Allen & Hamilton, Inc. was the prime consultant for human resource management for the organizations identified in the following paragraphs. The contact person for Booz-Allen & Hamilton is:

Ronald F. Smith  
Booz-Allen & Hamilton, Inc.  
Arlington, VA 22202  
Tel. 617 275-2225

#### C.4.1 Design and Development of Personnel Demonstration Project:

Naval Aviation Depot, Alameda, California. In support of Naval Industrial Improvement Program (NIIP) and the implementation of Naval Aviation Depots (NADEPs), Booz-Allen is providing support in the design and development of a Personnel Demonstration Project (PDP). NADEP Alameda provides re-work and aircraft modernization services to other Department of Navy organizational components. In the current era of privatization, NADEP faces serious competition from the private sector. In order to maximize their efficiency and effectiveness, Booz-Allen is analyzing work content, organization and quality for this 5,000 person workforce which includes military, civilian, professional and technical, as well as trades and crafts.

C.4.2 Space and Naval Warfare Systems Command (SPAWAR)  
Reorganization Support U.S. Navy. For SPAWAR, Booz-Allen & Hamilton, Inc. has supported a command-wide reorganization necessitated by the expansion of the SPAWAR mission as directed by the Secretary of the Navy. SPAWAR has been designated as the lead system engineering expertise in the Navy. This represents a significant expansion of the SPAWAR mission, resulting in a complete functional realignment of existing program offices and associated personnel. Booz-Allen has supported this realignment by conducting functional analyses to determine the optimal organization structure. In addition, manpower resource analyses determine appropriate staffing and financial impact analyses to address necessary changes in planning, programming, and budgeting documentation. Booz-Allen has also supported SPAWAR in meeting Consolidating Civilian Personnel Office documentation requirements stemming from the realignment of personnel in the command.

C.4.3 Redesign of Field Administration Workflow; A Major Oil Company. Booz-Allen & Hamilton, Inc. assisted the engineering and production subsidiary of a major integrated oil company improve organization effectiveness and reduce costs through

redesign of its field administration workflow. The maturity of its operations and the capability of today's computer and communication technology caused the firm to question the need for over 20 U.S. field offices to process accounting and other administrative functions. The Booz-Allen team analyzed field and headquarters administrative functions to determine the most effective way to support the business. Improvements to the workflow redesign included reduced management layers, elimination of information hand-offs, focused accountability, increased throughput/productivity and improved accuracy.

#### C.5 COOPERS & LYBRAND

Coopers & Lybrand (C&L) was the prime consultant for human resource management for the organizations identified in the following paragraphs. The contact person for Coopers & Lybrand is:

William Schuller  
Coopers & Lybrand  
Arlington, VA 22209  
Tel. 617 574-5000

C.5.1 Naval Air Depot Activity Group. As part of the multi-task effort to support the Navy Industrial Improvement Program, the Secretary of the Navy asked C&L to assist the Navy Aviation Depot community in initiating and institutionalizing a "corporate," depot-wide, long-range business planning process. The Naval Aviation Depot community is large, conducting more than \$1.5 billion annually in aircraft maintenance and redesign services, out of four depots in the East, and two in the West, having a total of about 24,000 employees. The depots are financed by the Navy Industrial Fund, which requires them to operate in buyer-seller relationships with their major customers.

C.5.2 Department of the Navy. The Navy awarded a contract to Coopers & Lybrand for training support required to implement a service-wide Executive Performance Appraisal System. This contract resulted from an earlier effort in which the Navy awarded contracts to C&L and four additional firms to develop recommended performance appraisal systems. C&L's appraisal system was selected for implementation because it best reflected requirements of the Civil Service Reform Act of 1978 and the Navy's objectives. Following the determination to implement C&L's system, this contract was awarded to provide necessary training support.

C.5.3 Battelle Memorial Institute. Coopers & Lybrand was awarded a contract by Battelle Memorial Institute, Pacific Northwest Laboratory to review their indirect organization and evaluate the Institute's current management systems, operating procedures, and overall organizational effectiveness. Battelle management anticipated reductions in revenue (lower government spending) and sought a strategy for responding to this changed environment. C&L was asked to conduct a thorough management review, assess the effectiveness of current operations, identify opportunities for achieving improvements, and develop an implementation plan for effecting desired changes. The client sought to achieve cost reduction without undermining scientific freedom and flexibility or program effectiveness.

C.5.4 An Intelligence Organization. A major intelligence organization awarded a contract to Coopers & Lybrand to conduct an assessment of one of its operational branches. Workload increases threatened to overwhelm operating systems and procedures. The objective of the study was to evaluate current operations including procedures, resource allocations, organization structure and staffing and present recommendations to address immediate operational problems and long-term business

challenges.

C.5.5 Secretary of the Navy. In conjunction with the Navy's Industrial Improvement Program and cost reduction initiatives, C&L Overhead Budget Management methodology was widely used and accepted for various Naval activities. The program was successfully implemented for the Office of the Secretary, the Office of Chief of Naval Operations, and the Headquarters Marine Corps. The study assisted the Secretary of the Navy in reducing the redundant functions and positions at headquarters and reassigning excess officers to appropriate field activities. These engagements were also designed to enable the Secretary to comply with the DOD Reorganization Act as it pertained to the Department of the Navy.

C.5.6 Department of the Navy. The Navy awarded a contract to Coopers & Lybrand to conduct a comprehensive management analysis of Navy Industrial Fund (NIF) activities. The NIF has 52 funded activities that generate annual revenues of \$15 billion. The study evaluated individual NIF activities and the overall NIF program, developed comparisons to private sector activities, and identified opportunities to improve the efficiency and/or effectiveness of NIF activities.

C.6 ERNST & WHINNEY.



Ernst & Whinney was the prime consultant for human resource management for the organizations identified in the following paragraphs. The contact person for Ernst & Whinney is:

W. John Cameron  
Ernst & Whinney  
Washington, DC 20036  
Tel.

C.6.1 Triborough Bridge and Tunnel Authority, New York, NY. Ernst & Whinney is currently conducting an evaluation of the Triborough Bridge and Tunnel Authority's organizational structure, administrative processes, and operations. The firm has recommended a restructuring of the first level of the organization to streamline and improve its operations, and to make it more responsive to its customers' needs.

C.6.2 New Jersey Department of Transportation. Ernst & Whinney is conducting a study of the department's organizational structure, policies and procedures staffing, and strategic planning and management. The firm has recommended and assisted in implementing major changes in the Department's structure, in many of its functions, and in its staffing.

C.6.3 Metropolitan Atlanta Regional Transit Authority. Ernst & Whinney is currently conducting an organizational review and evaluation of the Authority. The study is focusing on assisting the Authority in evolving from a developing to an operating organization. The objectives include identifying unnecessary functions, eliminating overlaps and duplications, and clarifying authority and responsibilities.

C.6.4 Denver Regional Transportation District. Ernst & Whinney conducted a management and operations review with substantial

goal structuring, systems planning, and facility planning components.

C.6.5 Chicago Regional Transportation Authority. Ernst & Whinney conducted a comprehensive management and organization study in response to legislation creating bus and rail boards and modifying the RTA's roles and responsibilities.

#### C.7 THE HAY GROUP

The Hay Group was the prime consultant for human resource management for the organizations identified in the following paragraphs. The contact person for the Hay Group is:

Thomas Wilson  
Hay Management Consultants  
Boston, MA 02109  
Tel. 617 367-7100

C.7.1 London Regional Transport, London. When London Regional Transport set up two operating companies - London Buses and London Underground - in 1985, Hay helped to shape new management pay plans. More recently, Hay has worked with the underground company - the world's largest urban railway - on a major review of its strategy and organization. With London Buses, Ltd., Hay has surveyed management and staff views about how to improve services and how to communicate objectives to its 12,000 staff members.

C.7.2 Sikorsky Aircraft. Hay Systems, Inc. (HSI), an independent subsidiary of the Hay Group, has worked with Sikorsky Aircraft in Stratford, Connecticut to help design a combat helicopter that could be flown by a single pilot. This design, the Light Helicopter Experimental (LHX), incorporates the results of Hay's human resources forecasting method. By forecasting

manpower and human capability requirements, Sikorsky can assure that projected LHX operators can perform all tasks successfully and that the sophisticated equipment can be maintained efficiently.

C.7.3 Aerospatiale. For this international helicopter, aircraft, defense and space manufacturer, Hay has helped reorganize headquarters staff to better match the company's renewed emphasis on its core businesses. To facilitate new human resources needs at Aerospatiale in Paris, Hay has also helped reorganize the internal training function and created simulation models for manpower planning and human resources cost control. A joint venture between Hay and Aerospatiale (Hay Space) focuses on computer-aided programs for training, development, and internal communications.

C.7.4 Shell Oil. A client of Hay reward services since the 1960's, Shell most recently has worked with Hay consultants to communicate organizational change in its Stanlow, England facility - Shell's largest production site in the U.K. Moving to a smaller, functional unit structure, Shell needed to communicate this mission to its various employee groups. Work ranged from organizing training sessions for managers, producing videos and coordinating contents of Shell's internal publications.

C.7.5 South Central Bell. To help South Central Bell, Birmingham, Alabama, modify its internal culture to reflect new strategy, Hay measured current culture and recommended approaches for new management to create a culture more consistent with the company's emerging values and needs. With the parent company, Bell South, Hay is leading a reassessment of the human resources organizational function to make it more responsive to emerging competitive needs. Hay also helped Bell South develop executive compensation plans that better match competitive practices in the

telecommunications industry.

#### C.8 PRICE WATERHOUSE.

Price Waterhouse was a consultant for human resource management for the organizations identified in the following paragraphs. The contact person for Price Waterhouse is:

Mary E. Kearney  
Price Waterhouse  
Boston, MA 02110  
Tel. 617) 439-4390

C.8.1 Southern New England Telephone Company (SNET). In 1987, SNET decided to offer its management level employees (approximately 4,000) an early retirement window. The company had made a long-term strategic decision to redeploy its managers to positions closer to its customers, at a time when the overall business climate was stable. It was important that the program be perceived as a well-managed business decision, without the threat of imminent layoffs. The key group of employees were the 1,400 pension service eligible employees who qualified to receive immediate pension distributions, but the offer was also extended to the 2,600 deferred vested employees. Management's goal was 300 to 400 positive decisions.

A three-part program was developed. First, employees could attend a Career Decision Workshop aimed at setting goals and evaluating career choices. Second, they then were invited to a half-day Financial Planning Workshop which focused on looking at retirement lifestyle goals and understanding the financial considerations in measuring and reaching these goals. Specific tax, pension distribution and cash flow issues relevant to a retirement decision were covered. More than 50 such seminars were conducted throughout Connecticut in a two-week period.

Third, all 4,000 SNET employees also had the option of filling out a personal financial questionnaire and receiving a personal Retirement Financial Analysis. In addition, an 800 number hot line, staffed by Price Waterhouse professionals, was available to answer questions about the questionnaire and the analysis.

C.8.2 Chevron. Because of declining oil prices, Chevron needed to reduce its staff by 4,000 to 5,000 employees. This would be accomplished through a voluntary separation program offered to 17,000 employees, followed by an involuntary program. Chevron's goal was to maximize participation in the voluntary program, thereby reducing the number of involuntary separations. Employees had approximately 3 weeks to decide to retire voluntarily. Price Waterhouse developed the Next Step Analysis to communicate the details of the voluntary separation program and to provide employees with a personal decision-making framework. A 3-hour seminar was developed to expand on the contents of the Next Step Analysis, to provide tax planning advice on the retirement plan distributions and give information on investment planning for the future. The seminars were presented at many locations throughout the U.S. to meet the needs of Chevron's geographically dispersed employees. The program was successful in the number of voluntary terminations and precluded the need to institute involuntary separations.

C.8.3 International Business Machines Corporation (IBM). During the fall of 1986 IBM offered over 40,000 of its employees the opportunity to participate in an early retirement window which offered an enhanced retirement package. In order to insure that its employees fully understood both the specific details of the offer and the implications of early retirement, Price Waterhouse was asked to provide assistance.

A three-part program was developed to help IBM employees evaluate the early retirement incentive offer. First, a

specialized seminar was developed which covered the financial and tax implications of the retirement program. These seminars were presented at IBM locations throughout the world by Price Waterhouse professionals. Second, a special Retirement Financial Analysis Report was developed which provided employees with a detailed analysis of their retirement financial situation. Third, an 800 number hotline staffed by Price Waterhouse financial planning experts was established to answer any retirement related questions of IBM employees. At the conclusion of the program, more employees signed up for the early retirement program than was initially anticipated.

#### C.9 TOUCHE ROSS & CO.

Touche Ross & Co. was the prime consultant for human resource management for the organizations identified in the following paragraphs. The contact person for Touche Ross & Co. is:

Stewart Rog  
Touche Ross & Co.  
Newark, NJ 07102  
Tel. 617 426-5151

C.9.1 New Jersey Transit. Touche Ross & Co. was engaged by a state transportation agency during their initial stages of operation. Touche Ross spent nine months helping them in all phases of their operation. Some of the major activities they performed during this engagement were addressing organizational issues. Touche Ross helped define organizational structure to provide a streamlined and effective organization for their new venture. Touche Ross developed detailed specifications to assist the agency in their recruiting and screening efforts.

C.9.2 Faberge, Inc. Touche Ross & Co. was engaged to evaluate the accounting and financial functions of Faberge, Inc. and selected corporate and division levels, and to perform a corporate restructuring program. The firm's overall goal was to address organizational development, compensation levels, position responsibilities, and systematic and operational workflow procedures.

C.9.3 McGregor Corporation. Due to the expanding manufacturing operations and overall diversification of the McGregor Corporation, Touche Ross & Co. assessed the compensation and benefits programs, as well as personnel policies and procedures which included performance evaluation programs. The assessment created uniformity in the application of benefits programs, corporate policies and procedures. As a result, Touche Ross restructured the compensation programs enabling management to effectively control related operational costs.

C.9.4 United Van Lines. Touch Ross & Co. was engaged by United Van Lines, a large household goods mover, to conduct a comprehensive organization survey.

Touche Ross suggested organizational realignments to meet current demands, recommended the organizational requirements for the future, prepared current and future position descriptions and assisted the client on a compensation system.

C.10 TOWERS PERRIN FORSTER & CROSBY

C.10.1 Shell Canada

Cresap was retained by the company to review the organizations for corporate administration, upstream and downstream business units, and related chemicals and coal business. The purpose of the review was to assist with a management reorganization in



light of a new business strategy, and to identify possible staff adjustment consistent with the company's desire to increase production while maintaining organizational flexibility and efficiency.

#### C.10.2 Tesoro Petroleum Corporation

Cresap recently completed a review of organizational effectiveness and efficiency for Tesoro Petroleum Corporation. The scope of the study encompassed employees in the corporate, operating (refining, marketing and crude supply, exploration and production, and oil field services), functional staff, and administrative units. Working groups made up of Tesoro staff and Cresap consultants studied each organizational unit, performed the fact-gathering and detailed analysis, and developed practical cost-reduction recommendations and plans for implementation.

Activity analysis was a principal technique used to gather information about the time, cost, and value of the activities performed within the company. This information, along with other collected data, was used to evaluate staff size and composition, organizational arrangements, and job designs.

#### C.10.3 United Airlines

For United Airlines, CRESAP recently completed a comprehensive rightsizing analysis at their worldwide base for maintenance located in San Francisco. This review encompassed a workforce of approximately 10,000 people in both white- and blue-collar positions.

Working in close coordination with client staff, CRESAP developed a comprehensive plan which increases both the effectiveness and efficiency of their operation by increasing staff in areas where they were needed to properly accommodate the effects of a

changing workload, while simultaneously lowering staffing levels in areas where the workload had decreased. Special emphasis was also placed on situations where addition of a relatively small number of positions with specialized skills would permit the reduction of a larger number of other positions as a result of those new skills being brought to bear.

#### C.10.4 Qantas Airways

Qantas retained Cresap to assist with a review of its operating divisions, including engineering and maintenance, flight operations, cabin crews, and airport operations. The objective of the review was to develop productivity improvement standards and systems aimed at improving the profitability of the airline, and to identify other operating cost reductions.

The results of the study provided annual operating cost savings of \$11 million in engineering and maintenance, \$10 million in flight operations, and \$4 million in airport operations.