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PROPOSAL

Proposal is a technical writing having its own format including different elements like plan, time management, cost management, etc. Proposal is of three types

① Structure-based proposal

It is of two types: Formal Proposal and Informal Proposal

② Nature-based proposal

It is of two types: Internal and External

③ Origin-based Proposal

It is of two types: Solicited and Unsolicited

A. STRUCTURE BASED PROPOSAL

→ Formal Proposal is for big project. It is prepared with sections and sub-sections. It is stylistic.

→ Informal Proposal is for small project. It is written in descriptive manner.

B. Nature-based Proposal

→ Internal Proposal is written for internal communication within the organization. It is less formal in nature.

→ External Proposal is prepared for outside communication with other organization. It is more formal in nature.

C. Origin-based Proposal

→ Solicited: According to the advertisement and request.

following the criteria, we prepare solicited

→ Unsollicited: Without any advertisement, request and criteria, we submit proposal for the solution of problem, increasement of sales and salaries.

PARTS OF THE PROPOSAL

I. Title Page
II. Acknowledgement
III. Table of contents
IV. List of Tables
V. List of Figures
VI. List of Abbreviations
VII. Abstract

1. Introduction
2. Statement of Problems
3. Objectives of the Project/Problem
4. Literature Review
5. Methodology
5.1 Primary Sources of Data Collection
5.1.1 Observation
5.1.2 Survey
5.1.3 Questionnaire
5.1.3.1 Interview
5.1.3.1.1 Personal Interview
5.1.3.1.2 Telephone Interview
5.1.3.2 Seminar

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5.2 Secondary Sources
5.2.1 Internal Record
5.2.2 Library Record
5.2.3 Government Organization / NGO Record
5.2.4 Internet

6. Cost Management
6.1 Cost Management on Material
6.2 Cost Management on Equipments
6.3 Salaries of Personnal
6.4 Transportation
6.5 Office Management
6.5.1 Agreement Paper of Land Lady / Land Lord for Rent
6.5.2 Water and Electricity Bill
6.5.3 Lodging and Fooding

7. Time Management
7.1 Time Management on Materials
7.2 Time Management on the Equipments.

8. Summary
9. Conclusion
10. References

Section - 3

WRITING PROPOSAL

3.1 Introduction

Webster's Encyclopedic Dictionary defines the term 'proposal' as a plan or scheme proposed. In Oxford Advanced Learner's Dictionary of Current English also, we find it defined as a formal suggestion or plan' According to M.'Ashraf Rizivi (2008), a proposal is "a method of persuading people to agree to the writers view or accept his suggestions." It is "a systematic, factual, formal, and persuasive description of a course of action or net of recommendations, or suggestions." In the words of R. C. Sharma and Krishna Mohan (2009), a proposal is "a writer's offer to undertake a project for creating something new or for changing or modifying an existing procedure, method, system or structure within a specified period of time." Sunita Mishra and a C. Murali Krishna (2004) have opined that "A proposal is a persuasive communication, generally written when you want to persuade readers to adopt a particular course of action."

As method by Rizvi (2008), a technical proposal is written "for a specific audience to meet a specific need." We might have to write a proposal for a new product we want to develop or try to persuade our employers to make a few costly change or we would want to suggest a few change in the marketing policy of our company. To do all this, we will have to write good proposal and present them persuasively and convincingly. As the main objective

of a proposal is to persuade the reader to accept the proposal course of action, it explains and justifies what it proposes.

In the words of Krishna Mohan and Meera Benerji (1994)," Every enterprising organization has a special group of people engaged in what is called research and development activities. The main task of this group is to suggest new designs of products which are economical, technically more sound and more efficient in performance. The suggestions so made are incorporated in the form of a proposal also called a technical proposal or engineering proposal or research proposal depending upon its forms." Another purpose for which a proposal is written is 'the solution of a technical problem'.

Types of Proposals:

There are different approaches to classify the proposals. The most important and widdely recognised ones have been mentioned below:

I. Structure - Non-formal/formal
II. The nature of audiencé- Internal/External
III. The source of origin- Solicited/Unsolicited

I. Non-formal/Formal:

Depending upon the format, propsal can be formal or non-formal. Non-fromal proposals are generally short. They are brief description of suggestions or recommendation that are introductory is nature. This type of proposal is writes to initiate small projects. A non-formal proposal may involve the use of letter formats or memo formats.

On the other hand, formal proposals are longer in size and are usually written to initiate big project which require elaborate description and discussion. A formal proposal involves use of the manuscript format and consists of several sections and sub-sections,

II. Internal/ External proposal:

Acording to the nature of audience, proposals can be internal or external. An internal proposal is offered to readers within

an organization. It may offer to study a problem, situation, conditiom or issue in the company or organization and may present different options for solving it. Proposing a plan to increase the sales of a company will require preparing an internal proposal. The tone of language used in internal proposals is less formal.

Unlike internal proposal, the external proposals are meant for communicating with the people outside an organization. They are more formal and elaborate than internal proposals. An external proposal may offer a plan to solve recommendations.

II. Solicited/ Unsolicited proposals:

A solicited proposal is written in response to a specific request from a client. The term 'solicit' implies 'to try to get something or persuade somebody to something. Many companies, government agencies institutions and organizations solicit proposal for their projects. As they want the best people to take their projection, they may make request for proposal open to increase competition. They specify their requirements and mention their conditions.

On the contrary, unsolicited proposals are prepared and submitted to the prospective employers or companies which are likely to offer the job or project without any request for a proposal. Such types of proposal intend to propose solutions or suggestions. These proposals are based on an objective assessment of a situation or condition by an individual or a form. Self initiated research and business projets usually involve unsolicited proposals.

3.2 Parts of the proposal:

A formal technical proposal generally contains the following parts.

i) Title part
ii) Abstract/ summary
iii) Statement of problem
iv) Rationale

v) Objectives
vi) Product/Methodology
vii) Time Management/ Schedule
ix) Summary
x) Conclusions
xi) Evaluation or follow-up
xii) Works cited

i) Title page:

The title page acts as a cover of the proposal and contains the following information: title, name & designation of the proposal, name of the organization to which the proposal writer belongs and the month and year of submission. There are different formats for Internal and External proposal. If the external proposal is being mailed outside your company to a client you also might include on the title page. The following are two sample title pages for internal proposal and for an external proposal:

Sample title page for an Internal proposal:

PROPOSED CABLE TRANSMISSION NETORK
BIRATNAGAR
TO
DINGLA BHOJPUR

Prepared by: ..... Date:.....
Janardan Joshi
Network planner

Reviewed by : ..... Date: .....
Ramesh Rai
Manager, capital planning

Recommended by: ..... Date:.....
Shambhu Shah
Manager, Facilitator

Recommended by: ..... Date: .....
Sita Shrestha
Director, Implementation Planning

Approved by: ..... Date: .....

Rabindra Rana
Vice President, Network Planning

Sample title page for an External proposal:

PROPOSAL TO MAINTAIN COMPUTER EQUIPMENT

For
Star Products, Pvt. Ltd.
New Baneswor,
Kathmandu

Submitted by
Ram Prasad Rajbhandari
Engineering Technician
Dec. 15, 2011

ii) Abstract/ Summary:

An abstract or a summary is a condensed version of the proposal as if summarises and highlights its major points. However, an abstract is more specialised and technical than executive summary.

The abstract is a brief overview of the proposal's key points geard toward a low-level reader. If the intended audience is composed of upper- level management, this unit might be called an executive summary. To accomplish the required brevity, you should limit your abstract to approximately three to ten sentences. These sentences can be presented as one paragraph or as smaller units of information separated by headings. This part summarises the entire proposal.

iii) Statement of problem:

This section contains an objective description of the problem or situation that the proposal intends to address. In other words, this part defines the need or the rational, or states the problem to which the proposal addresses itself. To establish the need you may sometimes have to give a brief background history in terms of the work already done and its inadequacy in the present circumstances.

As this section links the proposed course of action to the needs of the reader and the requirements of the situation, it gives credibility to the proposal and makes it convincing and acceptable.

iv) Rationale:

This section highlights the reason for conducting the research on a particular topic or the reason for studying the problem. The principles or reasons which explain a particular decision, course of action, belief etc. is known as rationale.

v) Objection:

This section includes a statement of both main and sub-objectives. The main objectives indicate the central thrust of our study whereas the sub-objectives identify the specific issues you propose to examine.

The objectives of the proposal should be clearly stated and should be specific is nature. Each sub-objective should delineate only one issue. The writer should use action- oriented verbs ouch as 'to determine', 'to find out' etc. in formulating sub-objectives which should be numerically listed.

vi) Procedure/ Methodology

The section on methodology summarises the proposed methods of data colloection and the procedure for investigating the problem. There are a number of methods and sources for collecting data. We may put them into the following categories:

a) Methods:
   - i) Personal observation
   - ii) Telephone interviews
   - iii) Personal interviews
   - iv) Questionnaires

b) Sources:
   - i) Internal Records
   - ii) Library
   - iii) On-line net and websites
   - vi) Cost- estimate or Budget:

This section is the kingpin in the proposal. In a solicited proposal, the cost data required would be indicated. All we have to do is to supply the information. But in an uhnsolicited proposal, we must show all the intims of anticipated expenditure. Our estimate should be realistic and complete, and include the amount required for the following items:

- Materials
- Equipment
- Computer
- Lab Testing
- Salaries of Personnel
- Travel
- Office contingencies and infra- structural facilities such as:
  - Land
  - Building
  - Water
  - Electricity

viii) Time management/ Schedule:

This section highlights how we will accomplish the prooposed work. It will clearly indicate the plan of action, facilities required, and the personnel who will excute the project. The plan of action should specify how the work will be divided, who will be responsible for each division and how much time would be required to complete it. We may tabulate the time schedule for the task. Usually a number of persons are needed to execute a proposal. The writer of the proposal should provide a brief description of their qualifications, achievements and experience for establishing their credentials.

x) Summary:

This section precisely describes the main contents of the roposal. It is an optional part. The writer may or may not include his part. Generally, it is avoided as the nature and function of this art are similar to that of abstract and conclusions.

Conclusion:

This one is also an optional element. It may be given when the situation demands. But if we have to include it in our proposal, we should state succintly the significance of the project and highlight once again the benefits that would acquire from it. We may also mention here the implications that may arise from our work.

xi) Evaluation or follow-up:

A good proposal includes a section on evaluation or quality control. This section is also termed as follow-up section. The evaluation methods tell whether our plan has achieved of quality control and progress according to our established schedule.

If our proposal is an ongoing construction or service reports that indicate whether the project is on schedule. Our progress reports compare what has happened with what was supposed to happen.

xii) Works cited:

As the heading 'works cited' indicates, this list contains all the works that we will cite in our text. The list simplifies documentation by permitting you to make only brief references to these works in the text. The list of works cited appears at the end of the paper. We must begin the list on a new page.

In order to acknowledge and handle sources, we must know how to prepare proper bibliographical references, document sources within our text handle quotations, and avoid plagirism. Two systems are in common use: MLA system and APA system.

A Sample Proposal

PROPOSAL
FOR
REDUCING OXYGEN EXPENSE

Prepared for
Dr. C. P. Chaulagain
Director
Bir Hospital

By
Prasanna Pradhan
Marketing Director
OM MEDICAL SUPPLIES
March 10, 2012

TABLE OF CONTENTS

ABSTRACT

Expenses for medical oxygen have increased steadily for several years. Now the federal government is reducing the amount of coverage that Medicare allows for prescription of oxygen.

The cost increase can be reduced through the use of our new Electronic Demand cannula. The Electronic Demand cannula oxygen to the patient only when the patient inhales. Oxygen is connected, flow during the exhalation phase. Therefore, oxygen is connerved.

This oxygen saving feature can reduce your oxygen expenses by as many as 50 percent. Patients who use portable oxygen supplies can enjoy prolonged interevals between refulling, thus providing more freedom and mobility.

1.0 INTRODUCTION

1.1 PURPOSE

This is a proposal to sell the new Electronic Demand to Bir Hospital, Kathamandu. This is to sell offers you a special discount when you purchase our Electronic Demand cannula in the quantities suggested in this proposal.

1.2 PROBLEMS

1.2.1 High costs

Since 1995, the price of medical grade oxygen has skyrocketed. It costs $ 10 per 1,000 cubic feet in 1995. Today medical grade oxygen costs $26 per 1,000 cu. ft. In fact, you can expect next year's oxygen expenses to double the amount you spent this year.

1.2.2 Governmental/ Insurance Involvement

Many factors have contributed to this soaring cost, including demand, product liability, and inflation. However two factors contributed the most. First , legislation reduced the amount that Medicare pays for prescription oxygen. Second, few insurance companies offer programs covering long-term prescription oxygen. Therefore, you or your patients, must pay the additional expenses.

1.2.3 Decreased Quality of service

Since prescription oxygen has risen in cost so dramatically, few medical service companies can produce affordable Electronic Demand and stay competitive. Since 1996, according to Medical Digest Bulletin, 30 percent of medical service have gone out of business. Your ability to receive quality service at an affordable price has diminished.

2.0 DISCUSSION

2.1 IMPLEMENTATION OF ELECTRONIC DEMAND CANNULA

Since the price of oxygen will not go down, you must try to use less while obtaining the [illegible]

Om Medical supplies, a leader in oxygen- administering technology, proposes the implementation of our new Electronic Demand cannula sing state of the art electronics, the Electronic Demand cannula senses the patinet's inspiratory effort. When a breath is delected the Electronic Demand dispenses oxygen through the patient's cannula. The patient receives oxygen only when he or she needs it.

Continuously flowing cannular waste gas during excalation and rest. Clinical studies have probed that 50 percent of the oxygen used by cannula proved that 50 percent of the oxygen used by cannula patients is wasted during that phase. These same tests also revealed that blood oxygen saturation does not significantly vary between continuous and intermittent flow cannules. The patient receives that same benefit from less oxygen.

2.2 TECHNICAL DESCRIPTION

The Electronic Demand cannula is an oxygen-administering device which is designed to conserve oxygen. The Electronic Demand cannula is composed of six main parts oxygen inlet connector, visual display indicators, power switch, patient connector. Ac odapter connector, and high impact plastic case

Oxygen Inlet connector:

The oxygen inlet connector is a Diss 1240 (Diameter Index safety system) and is made of chrome- plated brass.

Visual Display:

Two light emitting diodes provide visual indications of important functions. Alarm functions are monitored by a red light emitting diodes, Motorola No. R 32454. An indication of each delivered breath is given by the pulse display, which is a yellow light emitting diodes, Molorola No. Y 32454.

Power switch:

The power switch is an ALCo No. AT 2-3, DPSI slide switch. The dimensions are. 5 "x .30"; button height is 20".

Electrical specifications: Dry contact rating is 1 amp, contract resistance is 20 milliohms, and the life expectancy is 100,000 actuations.

Patient connector:

Attachment of the patient cannula system is made at the patient connector, which is located at the bottom of the case. The white nylon connector, Air Logic No. E- 3120-85, is a 10-32, UNF male threaded, straight barbed connector for 1/8 ID flexible tubing.

Ac Adapter connector:

An optional Ac adapter and battery charger assembly, part number PA -32, plugs into the Ac adapter connector, which is located at the bottom left- hand side of the case. The connecter is a male, D- subminiature, 12-pin flush insert supplied by Dupont connector systems. Their part number is Dcs: 69237009.

High- impact plastic case:

The Electronic Demand cannula is an oxygen- saving and administering device. By following these five easy steps, will you be able to enjoy the benefits of intermittent demand oxygen.

WARNING: Federal law prohibits the sale or use of this device without the order of a physician.

1 Attach your oxygen supply to the oxygen Inlet connector located at the top of the case.

2. Move the pulse- steady switch to the pulse position to begin intermittent demand flow.

3. Connect your nasal cannula to the patient outlet connector located at the bottom of the case.

4. Adjust your oxygen supply to the oxygen flow prescribed by your physician.

5. Put your nasal cannula on and breathe normally. The pulse light will turn on when a breath is delivered.

You are now ready to conserve oxygen by as much as 50 percent. Should you have the need to go back to continuous flow. just push the pulse- steady switch to the "steady" position.

2.4 QUALIFICATIONS AND EXPERIENCE

Om Medical supplies has been an international leader in the field of respiratory therapy since 1947. Pure Air introduced the first Intermittent positive pressure Breathing Respirator on the market. In 1960, responding to the needs of doctors and therapists, we produced the first life support volume ventilator, the vv-1. The vv-1 became the industry standard by which all other ventilators were measured.

In 1981, Om Medical supplies introduced the first computer controlled life support system, the vv-2. Technology developed for this product has found application in other areas as well. Recently, we introduced on such product, the Electronic Demand cannula.

Om Medical supplies is located in overland park, Oregon. The main manufacturing and engineering facility employs 450 people. Regional sales and service branch offices are located throughout Nepal.

2.5 PERSONNEL

Each of our engineering facilities is staffed by trained technicians ready to answer you questions. The following individual have been assigned to Bir Hospital.

Dr. Prasant pradhan

Dr. prasant pradhan (ph. D. Electrical Engineering, south central Texas university, 1995), has worked at Om Medical supplies since 1996. He has specialized in developing new medical equipment. He has supervised the development teams which worked on the x 29 respirator, and was lead development specialist for the pure air Electronic Device cannula.

Ruth Smith

Ruth (ME, Mechanical Engineering, Edinburg state University, 1999) has worked at Om Medical supplies since 1993. Ruth has received the highest level certification (Master Technician) offered by the IEEE for service on every puce of equipment developed, manufactured and sold by Om Medical supplies. She will be the manager of you Om equipment maintenance and trouble- shooting crew. Her responsibility is to ensure that your equipment is kept in outstanding working condition.

2.6 COST ESTIMATE/ BUDGET

Om Medical supplies is pleased to offer our pure Air Electronic Device cannula at cost-effective pricing. Table 2 explains the benefits you will derive when purchasing in quantity.

S. No.	Component	Estimted costs in Lakhs (NC)
1.	Laser Diode Module	3.0
2.	Field survey	2.0
3.	Travelling	1.0
4.	Reseascher	1.0
5.	Researcher Assistant	3.0
6.	Stationery	1.0
7.	Editing	1.0
8.	Compter	1.0
9.	Food and beaverage	1.0
10.	Rent	1.0
11.	Drinking water	1.0
12.	Electricity	1.0
13	Salaries and allowances	3.0
14.	Laboratory	1.0

3.0 CONCLUSION

3.1 MAJOR CONCERN

Prescription oxygen expenses are escalating while government support has been reduced. The cost increase to the patient and the health care facility will be enormous.

3.2 RECOMMENDATION

To offset the inevitable rise of oxygen expenses, we recommend the use of the Electronic Demand cannula.

WORKS CITED

1. Wilk, M. (1975). Every day's a matinee. New york: w.w. Norton
2. Duncan, D. & Burns, K. (1998). Lewis & clark. New york: Alfred knopf.
3. Whale, J. (Drector). (1931). Frankenstein [Film]. Hollywood, Univerral.

Sample 1

Sample Proposals for the Undergraduate Engineering Review

Contents:

Proposal # 1

Proposal#2

Proposal Links:

Proposals

Proposal Request

Proposal Checklist

UER

Before an article, report, or brief is accepted into the Undergraduate Engineering Review, the author must first submit a proposal that specifies the importance of the research, the scope and limitations of the research, and the methods for the research.

Submitters should read the journal's Request for Proposals before submitting.

A Proposal to Research the Storage Facility for Spent Nuclear Fuel at Yucca Mountain

Roger Bloom
October 1997

Introduction

Nuclear power plants produce more than 20 percent of the electricity used in the United States [Murray, 1989]. Unfortunately, nuclear fission, the process used to create this large amount energy, creates significant amounts of high level radioactive waste. More than 30,000 metric tons of nuclear waste have arisen from U.S. commercial reactors as well as high level nuclear weapons waste, such as uranium and plutonium [Roush, 1995]. Because of the build-up of this waste, some power plants will be forced to shut down. To avoid losing an important source of energy, a safe and economical place to keep this waste is necessary. This document proposes a literature review of whether Yucca Mountain is a suitable site for a nuclear waste repository. The proposed review will discuss the economical and environmental aspects of a national storage facility. This proposal includes my methods for gathering information, a schedule for completing the review, and my qualifications.

Statement of Problem

On January 1, 1998, the Department of Energy (DOE) must accept spent nuclear fuel from commercial plants for permanent storage [Clark, 1997]. However, the DOE is undecided on where to put this high level radioactive waste. Yucca Mountain, located in Nevada, is a proposed site.

There are many questions regarding the safety of the Yucca Mountain waste repository. Researchers at Los Alamos National Laboratory disagree over the long-term safety of the proposed high level nuclear waste site located in Nevada. In 1994, Charles Bowman, a researcher at Los Alamos, developed a theory claiming

that years of storing waste in the mountain may actually start a nuclear chain reaction and explode, similar to an atomic bomb [Taubes, 1995]. The stir caused by theory suggests that researchers have not explored all sides of the safety issue concerning potentially hazardous situations at Yucca Mountain.

Bowman's theory that Yucca Mountain could explode is based upon the idea that enough waste will eventually disperse through the rock to create a critical mass. A critical mass is an amount of fissile material, such as plutonium, containing enough mass to start a neutron chain reaction [Murray, 1989]. Bowman argues that if this chain reaction were started underground, the rocks in the ground would help keep the system compressed and speed up the chain reaction [Taubes, 1995]. A chain reaction formed underground could then generate huge amounts of energy in a fraction of a second, resulting in a nuclear blast. A nuclear explosion of this magnitude would emit large amounts of radioactivity into the air and ground water.

Another safety concern is the possibility of a volcanic eruption in Yucca Mountain. The long-term nuclear waste storage facility needs to remain stable for at least 10,000 years to allow the radioactive isotopes to decay to natural levels [Clark, 1997]. There are at least a dozen young volcanoes within 40 kilometers of the proposed Yucca Mountain waste site [Weiss, 1996]. The proximity of Yucca Mountain to these volcanoes makes it possible to have a volcanic eruption pass through the spent fuel waste repository. Such a volcanic eruption could release damaging amounts of radioactivity to the environment.

Objectives

I propose to review the available literature about using Yucca Mountain as a possible repository for spent nuclear fuel. In this review I will achieve the following two goals:

1. explain the criteria for a suitable repository of high-level radioactive waste; and
2. determine whether Yucca Mountain meets these criteria.

According to the Department of Energy (DOE), a repository for high-level radioactive waste must meet several criteria including safety, location, and economics [Roush, 1995]. Safety includes not only the effect of the repository on people near the site, but also people along the transportation routes to the site. In my research, I will consider both groups of people. As far as location, a waste site cannot be in an area with a large population or near a ground water supply. Also, because one of the most significant factors in determining the life span of a possible repository is how long the waste storage canisters will remain intact, the waste site must be located in a dry climate to eliminate the moisture that can cause the waste canisters to corrode. The economics involved in selecting a site is another criterion. At present, the Department of Energy (DOE) has spent more than 1.7 billion dollars on the Yucca Mountain project [Taubes, 1995]. For that reason, much pressure exists to select Yucca Mountain as a repository site; otherwise, this money would have been wasted. Other costs, though, have to be considered. For instance, how economical is it to transport radioactive waste across several states to a single national site? I will try to account for as many of these other costs as possible.

After explaining the criteria, I will assess how well Yucca Mountain meets those criteria. In this assessment, I will not assign a numerical score for each criterion. Rather, I will discuss qualitatively how well Yucca Mountain meets each criterion. In some situations, disagreement exists among experts as to how well Yucca Mountain meets a criterion. In such cases, I will present both sides. In this assessment, only Yucca Mountain will be considered as a possible site. Although many sites in the United States could meet the DOE's established criteria, I will consider only Yucca Mountain because the DOE is considering only Yucca Mountain [Taube, 1995].

Plan of Action

This section presents my plan for obtaining the objectives discussed in the previous section. There has been an increase of interest in the nuclear industry concerning the Yucca Mountain site

because of the January 1,1998, deadline for the DOE. Several journal articles and papers discussing the possibility of Yucca Mountain as a spent fuel repository in our near future have surfaced as a consequence of that interest. These articles and books about the dangers of nuclear waste should provide sufficient information for me to complete my review. The following two paragraphs will discuss how I will use these sources in my research.

The first goal of my research is to explain the criteria for determining whether a nuclear waste repository is suitable. For example, will the rock structure be able to withstand human invasion in the future [Clark, 1997]? What will happen if the waste containers corrode and do not last as long as predicted? Will the natural setting contain the waste? To achieve this goal, I will rely on "Background on 40 CFR Part 197 Environmental Standards for Yucca Mountain" [Clark, 1997], the DOE Yucca Mountain home page [1997], and the book Understanding Radioactive Waste [Murray, 1989].

A second goal of my literature review is to evaluate Yucca Mountain meets those criteria. I will base my evaluation on the sources mentioned above as well as specific Environmental Protection Agency standards. I also intend to research the validity of possible environmental disasters, such as the explosion theory. To accomplish the goal, I will rely on the paper presented by Clark [1997], and on the brook Blowup at Yucca Mountain [Taubes, 1995]

Because engineering students are the primary audience for my proposed research topic and may not be familiar with the history of nuclear waste, I will provide a background on past methods used for waste storage. People in the nuclear field with some knowledge of the waste problem facing the industry may be a secondary audience.

Management Plan

This section presents my schedule, costs, and qualifications for completing the proposed research. My research culminates in a

formal report, which will be completed by December 5, 1997. To reach this goal, I will follow the schedule presented in Figure 1. Since I already possess literature on the subject of Yucca Mountain as a nuclear waste site, most of my time will be spent sorting through the literature to find key results, and presenting those results to the audience.

Given that all my sources are available through the University of Wisconsin library system, there is no appreciable cost associated with performing this review, unless one takes into consideration the amount of tuition spent on maintaining the university libraries. The only other minor costs are photocopying articles, creating transparencies for my presentation, printing my report, and binding my report. I estimate these expenses will not exceed $20.

I am a senior in the Engineering Physics Department at the University of Wisconsin at Madison, majoring in nuclear engineering and physics. I have taken several classes related to nuclear waste, economics, and environmental studies. I believe that these courses will aid me in preparing the proposed review. For further information about my qualifications, see the attached resume.

Conclusion

More than 30,000 metric tons of nuclear waste have arisen from U.S. commercial reactors as well as high level nuclear weapons waste, such as uranium and plutonium [Roush, 1995]. This document has proposed research to evaluate the possibility of using Yucca Mountain as a possible repository for this spent nuclear fuel. The proposed research will achieve the following goals: (1) explain the criteria necessary to make a suitable high level radioactive waste repository, and (2) determine if Yucca Mountain meets these criteria. The research will include a formal presentation on November 11 and a formal report on December 5.

References

Clark, Raymond L., "Background on 40 CFR Part 197 Environmental Radiation Protection Standards for Yucca

Mountain." Proceedings of the 1997 Waste Management Conference (Washington, D.C.: U.S. Environmental Protection Agency, 1997).

Kerr, R., "New Way to Ask the Experts: Rating Radioactive Waste Risks," Science, vol.274, (November1996), pp. 913-914.

Murray, Raymond L., Understanding Nuclear Waste (Battelle Press, 1989).

Roush, W., "Can Nuclear Waste Keep Yucca Mountain Dry-and Safe?" Science, vol. 270, (December 1995), pp. 1761-1762.

Taubes, G., "Blowup at Yucca Mountain," Science, vol.268, (June 1995), pp. 1836-1839.

Sample 2

Can Help Predict Earthquakes

Christopher Gray

February 1995

Introduction

Throughout the world, devastating earthquakes occur with little or no advance warning. Some of these earthquakes kill hundreds of people. If the times, magnitudes, and locations of these earthquakes could be accurately predicted, many lives could be saved. This document proposes a review of how monitoring geophysical precursors can help in the short-term prediction of earthquakes. The proposed review will discuss the physical principles behind the monitoring of three common precursors and evaluate how accurate each monitoring is in predicting earthquakes. Included in this proposal are my methods for gathering information, a schedule for completing the review, and my qualifications.

Justification of Proposed Review

On the morning of April 18, 1906, the population of San Francisco was awakened by violent shaking and by the roar caused by the writhing and collapsing of buildings [Hodgson, 1964]. The

ground appeared to be thrown into waves that twisted railways and broke the pavement into great cracks. Many buildings collapsed, while others were severely damaged. The earthquake caused fires in fifty or more points throughout the city. Fire stations were destroyed, alarms were put out of commission, and water mains were broken. As a result, the fires quickly spread throughout the city and continued for three days. The fires destroyed a 5 square-mile section at the heart of the city [Mileti and Fitzpatrick, 1993]. Even more disastrous was the Kwanto earthquake in Japan that devastated the cities of Yokohama and Tokyo on September 1, 1923 [Hodgson, 1993]. In Yokohama, over 50 percent of the buildings were destroyed [Bolt, 1993], and as many as 208 fires broke out and spread through the city [Hodgson, 1964]. When the disaster was over, 33,000 people were dead [Bolt, 1993]. In Tokyo, the damage from the earthquake was less, but the resulting fires were more devastating. The fires lasted three days and destroyed 40 percent of the city [Hodgson, 1964]. After the fire, 68,000 people were dead and 1 million people were homeless [Bolt, 1993].

The 1906 San Francisco earthquake and the Kwanto earthquake were two of the most famous and devastating earthquakes of this century. These earthquakes struck without warning and with disastrous results. If earthquakes could be predicted, people would be able to evacuate from buildings, bridges, and overpasses, where most deaths occur.

Some earthquakes have been successfully predicted. One of the most famous predictions was the Haicheng Prediction in China. In 1970, Chinese scientists targeted the Liaoning Province as a site with potential for a large earthquake. These scientists felt that an earthquake would occur there in 1974 or 1975. On December 20, 1974, an earthquake warning was issued. Two days later, a magnitude 4.8 earthquake struck the Liaoning Province; however, further monitoring suggested a larger earthquake was imminent [Mileti and others, 1981]. On February 4, 1975, the Chinese issued a warning that an earthquake would strike Haicheng within 24 hours [Bolt, 1993]. The people in Haicheng were evacuated, and about 5.5 hours later, a magnitude 7.3 earthquake shook the city of

Haicheng. If the people hadn't been evacuated, the death toll could have exceeded 100,000.

Using geophysical precursors, the Chinese have predicted more than ten earthquakes with magnitudes greater than 5.0 [Meyer, 1977]. For example, the Chinese predicted a pair of earthquakes of magnitude 6.9 that occurred 97 minutes apart in Yunnan on May 19, 1976 [Bolt, 1993]. Despite these successes, the Chinese failed to predict the earthquake that struck the city of Tangshan on July 27, 1976; this earthquake killed 250,000 people and injured 500,000 more [Bolt, 1988]. This earthquake wasn't completely unexpected, but the Chinese believed it to be a few years away. Other earthquakes have been predicted, but the predictions didn't have enough precision for warnings to be issued. For example, in 1983, a young geophysicist predicted that an earthquake of magnitude 8 would strike Mexico City within four years [Deshpande, 1987]. Two years later, an earthquake of magnitude 8 did strike Mexico City. Because the prediction was not more precise, no warning was issued and the earthquake took the population of Mexico City by surprise. Other predictions have turned out to be false warnings. For example, an earthquake warning was issued in August 1976 near Hong Kong [Bolt, 1988]. During the earthquake alert, people slept outdoors for two months. No earthquake occurred.

Objectives

I propose to review the available literature on how geophysical precursors can be used for short-term predictions of earthquakes. In this review, I will achieve the following three goals:

- explain three commonly monitored geophysical precursors: ground uplift and tilt, increases in radon emissions, and changes in the electrical resistivity of rocks;
- show what happens to each of these precursors during the five stages of an earthquake; and
- discuss how each of these precursors is used for short-term earthquake predictions.

Geophysical precursors are changes in the physical state of the earth that are precursory to earthquakes. In addition to monitoring geophysical precursors, there are other strategies for predicting earthquakes–in particular, analyzing statistical data on prior earthquakes. Analyzing statistical data on prior earthquakes, however, is solely a long-term prediction technique [Bolt, 1993]. For that reason, I will not consider it.

In my review, I will discuss three common geophysical precursors: ground uplift and tilt, increases in radon emissions, and changes in the electrical resistivity of rocks. Earthquakes occur in five stages as there is build up of elastic strain within faults in the earth, followed by the development of cracks in the rocks, then the influx of water into those cracks. The fourth stage is the actual rupture of the fault and the release of seismic waves. The fifth stage is the sudden drop in stress in the fault. In this stage, aftershocks occurs.

During these five stages, the geophysical precursors follow distinct patterns. For instance, the ground uplift and tilt increases during the second stage as the volume of rock increases. In my review, I will relate how the three geophysical precursors relate to the five stages of an earthquake and how well this relation can be used to predict the oncoming fault rupture.

Plan of Action

This section presents my plan for obtaining the objectives discussed in the previous section. Because of the recent earthquakes in California and Japan, there has arisen a strong interest to predict earthquakes precisely. As a consequence of that strong interest, many books and journals have been written on earthquakes and earthquake prediction. I have gathered five books and several articles on the subject. In addition, there are dozens of books and articles available in the library. These books and articles should provide sufficient information for me to write my review. The following paragraphs discuss how I will use these sources in my research.

The first goal of my research is to explain the physical principles behind monitoring geophysical precursors. For example, why does the electrical resistivity of rocks decrease before an oncoming earthquake? Or, what does a sudden increase in random emissions reveal about the future likelihood of a massive earthquake? The second goal of my research is to show what happens to each of these precursors during the five stages of an earthquake. To achieve these two goals, I will rely on three books that give an overview to earthquake prediction: Earthquakes [Bolt, 1988], Earthquakes and Geological Discovery [Bolt, 1993], and Earthquakes and Earth Structure [Hodgson, 1964].

A third primary goal of the literature review is to cover the accuracy of monitoring each precursor. By accuracy, I mean how well does the method work in predicting the time, place, and size of earthquakes. This discussion will not include many statistics on the predictions of earthquakes, because at present there just haven't been enough successful predictions to validate these types of statistics. Instead, I intend to evaluate the potential accuracy of monitoring each precursor based on the opinions of experts and preliminary data. To achieve this goal, I will rely on two of my most recent sources: The Great Earthquake Experiment [Mileti and Fitzpatrick, 1993] and Earthquakes and Geological Discovery [Bolt, 1993].

Should I require additional sources other than the ones I have, I will search for them in the library system at the University of Wisconsin. Should I not be able to find that information, I will modify the scope of my research accordingly.

Because the primary readers for my proposed literature review are engineering students who are probably not familiar with the theories behind earthquakes, I will have to provide selected background information from my sources. These engineering students already know that earthquakes are devastating. They also know that if earthquakes could be predicted, people would be able to prepare for them and lives would be saved. However, they may not know the different methods of predicting earthquakes. My

intent is to inform these students of three methods of predicting earthquakes.

A secondary audience to the review would be non-technical readers who either live in earthquake-prone areas or are affected financially when earthquakes occur. My proposed literature review will provide this group with an unbiased discussion of three methods for earthquake prediction. This discussion, drawing much from overview chapters in Earthquakes, Animals and Man [Deshpande, 1987] and California Quake [Meyer, 1977], will put into perspective how accurate, or inaccurate, the named methods are and what hurdles face engineers who try to predict earthquakes.

Management Plan

This section presents my schedule, costs, and qualifications for performing the proposed research. The proposed research project culminates in a formal report that will be completed by December 6, 1995. To reach this goal, I will follow the schedule presented in Figure 1. Because I already possess several books and articles on earthquake prediction, most of my time will be spent sifting through the information, finding the key results, and presenting those results to the audience.

Given that I can obtain all my sources for the literature review from the library, there is no appreciable cost associated with performing this literature review. The only costs, which will be minor, are for copying articles, printing the review, and spiral binding the review. I estimate that I can do these tasks for under $10.

I am a senior in the Geological Engineering Department at the University of Wisconsin at Madison. In my undergraduate courses I have taken rock mechanics, soil mechanics, geophysics, and stratigraphy, all of which have included the principles of seismology and stress-strain relationships. In addition, I have taken field courses on structural geology that have introduced me to subsurface behaviors. I believe that these courses and my hands-on experience will aid me in assimilating the proposed literature

review. For further information about my qualifications, see the attached resume (not attached on this web site).

References

Bolt, Bruce A., Earthquakes (New York: W. H. Freeman and Company, 1988).

Bolt, Bruce A., Earthquakes and Geological Discovery (New York: Scientific American Library, 1993).

Deshpande, Prof. B.G., Earthquakes, Animals and Man (Pune, India: The Maharasthra Association for the Cultivation of Science, 1987.)

Hodgson, John H., Earthquakes and Earth Structure (Englewood Cliffs, NJ: Prentice-Hall, 1964).

Meyer, Larry L., California Quake (Nashville: Sherbourne Press, 1977).

Mileti, Dennis S., and Colleen Fitzpatrick, The Great Earthquake Experiment (Boulder, Colorado: Westview Press, 1993).

Last updated 2/99
http://www.me.vt.edu/writing/
httpliae3.cen.uiuc.edu/writing/

Exercises:

1. As a president of the students' Union of your institution prepare a proposal for the setting up of a cultural centre on the campus. The proposal is to be written in the form of format proposal and submitted to the Dean, student welfare.
2. As an engineering graduate, you have decided to establish a manufactring unit in your twon. You wish to avail of the

liberalised loan facility under the self emplyemnt ncheme. Draft a proposal for the manufacture of an item of your choice, neeking loan from the Industrial Deuelopment Finance corpioration.

3. As a Branch Manager of Nepal Bank in your town, you wish to expand the services and facilities on popular demand. These include provision of 50 lockers, 1 teller counter 3 staff quarters and 1 additinal office room etc. Invent the necessary details and propare a proposal to be sent to the Divisional Manager.

4. Alpha computer Masufacturing (ACM), a muth- mational company wasts to improve the existing parking facilities for the four wheeler and two wheeler vehicles of its staff. As a personal Manager ACM, draft a proposal to be sent to the secretary, Board of Directors, of your company for improving the parking facilities. You proposal should include the following issues:

   Area availability, lighting, provision of stands and roofs, arrangement of securitgy, issue of identity cards, fixing the rent, etc.

5. As a public Relations offier of sunkoshi Food products Ltd., You have been asked to prepare a proposal for setting up a cultural and Racreation centre on the company's factory premises. The proposal is to be considered by the board of directors in its next meeting write a proposal for submission to the Managing Director of the company.

❑❑❑

c. Ferry, J.D., Name of the Book, Publisher, New York, 1980, PP 31-140

APPENDICES

The method used to obtain the results in this report is one of many methods available. It is the one chosen because of the availability of the equipment. Other methods may be used equally as well.

4.3.3 Parts and Components of Formal Report

Let us first examine the elements that constitute the structure of informational and interpretive reports. We may define an element as a physical homogeneous part, easily distinguished by this heading, content or format. The sequence in which these elements appear in a report are more or less standardised by the prevailing practices in the professional world. The usual sequence is shown below:

4.3.3.1 Preliminary Section

a. Cover page
b. Letter of transmittal/ Preface
c. Title page
d. Acknowledgements
e. Table of contents
f. List of figures and tables
g. Abstract/ Executive summary

4.3.3.2 Main section

a. Introduction
b. Discussion/ Body
c. Summary/ Conclusion
d. Recommendation

4.3.3.3 Documentation

a. Notes (contextual/footnotes)
b. Bibliography
c. Appendix

A. Cover Page

Formats for cover page may vary. The minimum information includes name of presenter, date and title. Be careful in arriving at a title. Be as specific as possible, avoid unfamiliar abbreviations. Because cover is what readers first see as they pick up a report. Covers also protect pages during handling and storage. They also bestow dignity, authority and attractiveness. They bind a bundle of manuscript into a finished work that looks and feels like a report and has some of the characteristics of a printed and bound book. While you are formatting your report, remember that when you fasten it into cover about an inch of left margin will be lost. If you want an inch of margin, you must leave two inches.

Example

CHARACTERISTICS OF VENUS AND MERCURY

By.

Anne K. Chimato

English 430

27 July 1991

B. Letter of transmittal and preface

In content letter of transmittal and preface are often quite similar. They usually differ in format and intended audience. You will use the letter of transmittal when the audience is specified: a single person or a single group. Generally, you will use the preface for a more general audience when you may not know specifically who will be reading your report. Both of these introduce the reader to the report. These should be brief. Always include the following basic elements. Depending upon the structure of your report additionally, you may include some of these elements: acknowledgements, features of the report that may be of special interest, list of existing or future reports in the same subject, background material, special problems etc. Example for the letter of transmittal and preface are given below:

Gattin Hall

Briand, MA 02139

July 27, 1991

Dr. Ross Alm

Associate professor of English
Weaver University
Briand, MA 02139

Dear Dr. Alm

I submit the accompanying report entitled "characteristics of Venus and Mercury" as the Final project for English 430, Technical writing.

The report discusses the characteristics of both Venus and Mercury, covering size, mass, density, physical appearance and atmosphere. Recent information about Mercury obtained by the most recent probe, Mariner 10, is incorporated into the report.

I am indebted to Ms. Mary Fran Buchler of JPL who has allowed me to quote extensively from her unpublished work on Mariner 10:

Sincerely
Anne K. Chimato
English 430

PREFACE

In recent years the National Aeronautics and Space Administration (NASA) has explored the inner planets of our solar system, Venus and Mercury with robot space probes. This report, part of NASA's educational series for high school students, report the information from the latest probe, Mariner 10. Characteristics of both Venus and Mercury- including size, density, physical appearance and atmosphere are discussed.

Of particular interest in this report is the surprising finding that Mercury, contrary to scientific expectation has a magnetic field. This finding may cause present theories about the generation of magnetic fields within planets to be revised.

For list of other reports of NASA's space probes, write to NASA, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California 91125.

C. Title Page

Like report covers, little pages perform several functions. They dignify the reports they preface, of course, but far more important, they provide indentifying matter and help to orient the report users to their reading tasks. To give dignity a little page must be attractive and well designed. Symmetry and balance are important as are neatness and freedom from clufter. The most important items should be boldly printed; items of lesser importance should be subordinated usually the following four items appear on title pages:

- Name of the company or person preparing the report.
- Name of the company or person for which the report was prepared.
- Title and sometimes subtitle of the report.
- Date of submission or publication of the report.

Examples:

Title Page

CHARACTERISTICS OF VENUS AND MERCURY

Prepared for

Professor Ross Alm

English 430

Technical Writing

By

Anne K. Chimato

27 July 1991

D. Acknowledgements

It is necessary to acknowledge any help, assistance or guidence received from different persons or organisations. It is just a 'thank you note'. In this case you should be sincere and

courteous and have a variety in your expressions. A few commonly used expressions are given below:

(a) We thank .....
(b) We are grateful .....
(c) We are indebted .....
(d) We are deeply indebted .....
(e) We must express our gratitude .....
(f) We owe a great deal .....
(g) We are deeply grateful .....
(h) We acknowledge our indebtedness .....
(i) We are highly obliged to .....
(j) Thanks are due .....
(k) We are particularly grateful .....
(l) We should like to thank .....
(m) We must acknowledge our obligation .....
(n) We must acknowledge our deep sense of gratitude .....
(o) We wish to record our appreciation.....

The resons for thanking the person or persons are also stated. For example, we are grateful to Mr. X for his useful advice. 'We wish to express our appreciation to Mr. Y for reading the first draft of the report.' If there is a preface, acknowledgements may not appear as a separate element but this information may be included in the preface itself. If you have the slightest doubt whether a person would feel embarrassed if his name is mentioned in the acknowledgments, you should secure his permission.

Sample:

We are indebted to Prof. Dr. Y.P. Yadav for his painstaking persual and helpful suggestions for further improvement in the anuscript.

We are equally grateful to Prof. Dr. Sib Raj Pokharel, the en Dean, IOE, and Prof. Dr. Mukunda Man Singh Pradhan, the

then Campus Chief, for their encouragement, Research Training Unit RTU (Humanities) for funding this project and Dr. Bal Krishna Sapkota, HOD, Department of Science and Humanities for his moral support. Our sincere thanks are due to Mr. Rajendra Prasad Adhikari the programme officer, Nepal Engineering College, for providing us with a specimen seminar paper. We would like to thank Jamuna Chapagain and Uttam Adhikari for their Valuable help in the computer typing of this material and printing it.

Every attempt has been made to contact other copyright holders. We would be pleased to hear from them in order to make acknowledgement in the future editions of this book. In particular, we own a great deal to the works cited in REFERENCES for compiling, extracting and adapting materials in preparing this textbook. Finally, we would also appreciate suggestions for its further improvement in future.

Table of content

A table of contents is necessary only for long and complicated reports. It serves the reader as a locating device. It forecasts the extent and nature of the topical coverage and suggests the logic of the arrangement and the relationship of the parts. It should list all first and second level headings; the abstract, the list of figures; tables and abbreviations and the pages on which they occur; and the appendixes.

A system of numbers, letters, type styles, in donations and other mechanical aids has to be selected so that the table of contents will perform its intended functions. There are many acceptable variations in table of contents. Here is one example:

CONTENTS

List of Figure of Tables

(g) Abstract / Executive Summary

Abstracts and Summaries are overviews of the facts, results, conclusions and overviews of the facts, results, conclusions and recommendations of a report. Usually abstracts are placed before technical reports such as empirical research reports. Summaries are placed before proposal and feasibility reports.

These are two types of abstracts: informative and descriptive. Informative abstracts are most often intended for an

expert audience; therefore, you can use technical language of the field freely. The main purpose of descriptive abstract is to help the busy readers decide if they need the information in the report enough to read it entirely. This type of abstract merely tells what the full reports contain.

Example:

The management of the process by which technical documents are produced usually proceeds according to one of two models, the division of labour model on the 'integrated team' model. This article reports on a survey that suggests the prevalence of each model and that gives insights into how the choice of a management model affects the practice of technical communication and the attitudes of the technical communications.

The Executive Summary:

It ensures that the points of that report important to an executive audience are immediately accessible to that audience. It is written is non-technical language suited to an executive audience. It emphasizes the material the executives need in their decision-making process. Place an executives summary immediately before the introduction and label it 'Summary' or 'Executive Summary." It short, reports and memorandum reports, the executive summary often replaces the introduction and is followed immediately by the major discussion.

Example:

The university is steadily falling behind in the faculty and student use of computers. Our existing computer labs have insufficient number of computers, and those we do have are badly dated. Too many graduates are leaving the university as computer illiterates.

Information resources have considered three solutions to the problem:

(1) Provide those students and faculty who want them with micro- computers through the university bookstore at deep discounts. Purchasers would arrange their own financing if needed.

(2) Upgrade the university computer labs by providing $ 1 million over the text fiscal year to provide microcomputers, printers, software, and new furniture.

We recommend both alternatives 1 and 2. Solutions 1 and 2 would make enough computers available for the immediate future to encourage their use by both students and faculty.

4.3.3.2 Main Section

(a) Introduction

A good introduction forecasts what is to follow in the rest of the report. It directs the readers mind to what the subject and purpose are. It sets limits to the scope of the subject matter and reveals for the reader the plan of development of the report.

Announce your specific **subject** loud and clear in the introduction, preferably in the every first sentence. The sentence "This paper will discuss several of the more significant applications of the exploding wire phenomenon to modern science" may not be very subtle, but it gets the job done. The reader knows what the subject is. With the statement of subject, you often need to **define some important terms** that may be unfamiliar to your readers, e.g., the previous sentence should follow these two sentences that define subject. "A study of the exploding wire phenomenon is a study of the body of knowledge and inquiry around the explosion of fine metal wire by a sudden and large pulse of current. The explosion is accompanied by physical manifestations in the form of loud noise, shock waves, intense light for a short period, and high temperatures." If you are writing for non-specialists, you may introduce your subject with an interest-catching step. This step may be rather extended or you may simply extract a particularly **interesting fact** from the main body of your paper.

Introduction part should also **state the purpose** of writing about the subject you have announced, e.g.,"In this article I use illustrative narratives to argue that direct use to word processors can benefit any communicators in business, industry, or academic."

Readers who have no reason to be interested in such a discussion will know there is no purpose in their reading the report. Purpose statement often deals with the **significance of the subject**. A writer who had 'the application of human engineering to technical writing' as his subject announced his purpose this way: Regardless of your writing specialty, however, you will be more effective as a technical writer if you become familiar with human engineering and learn to apply human-engineering principles. The **statement of scope** further qualifies the subject. It announces how broad and conversely, how limited the treatment of the subject will be. Often it indicates the level of competence expected in the reader, e.g., "In this report I explain the application of super conductivity in electric power system in a manner suitable for college undergraduates".

In a **plan of development,** you forecast your report's organization and content. If you tell your reader what you are going to cover, they will be more ready to comprehend as they read along. The following, taken from the introduction to a paper on iron enrichment of flour, is a good example of a plan development.

"This study presents a basic introduction to three major areas of concern in regard to iron enrichment:

(1) questions on which form of iron is best suited for enrichment use,

(2) potential health risks from super enrichment- cardio-vascular disease, hemo- chromatosis, and masking of certain disorders; and

(3) the inconsistencies in basic knowledge as they relate to the definitions, extent, and causes of iron deficiency."

When necessary you can incorporate a brief theoretical or historical background into your introduction. Such information may well catch the interest of the reader, e.g., "Climatologists attribute the warming trend to the furnaces of civilization which have been spewing forth increasing loads of carbon dioxide to the atmosphere. This colourless and odorless gas, exhaled by man and used by plants to make themselves green, restricts the escape into space of infrared radiation from sun- warmed earth. Since increased CO_2 absorbs more of the infrared radiation than

formerly, a larger amount of heat accumulates, causing a slight but significant increase in average global temperatures. This impact of atmospheric CO_2 on climate- dubbed the "greenhouse effect" – has become more apparent in recent years because of the escalating rate at which power plants and industry throughout the world have burned coal, oil from shale and synthetic oil and gas."

(b) Discussion / Body

Except in very short reports, discussion itself does not appear as a heading of any section. It will be the longest section of your report. In long reports, there are a number of sections incorporating material under several apt headings and sub-heading. Your purpose and your content will largely determine the form of this section.

When thinking about your discussion, remember that almost every technical report answers a question or questions. Ask and answer the reporter's old standbys–Who? What? When? Where? Why? How? Use the always important "So–What?" to explore the significant implications of your information. However, you approach your discussion; project yourself into the minds of your readers. What questions do they need answered to understand your discussion? What details do they need to follow your argument? You will find that you must walk a narrow line between too little detail and too much.

Too little detail is really not measured in bulk but in missing links in your chain of discussion. You must supply enough detail to lead the reader up to your level of competence. You are most likely to leave out crucial details at some basic point that, because of your familiarity with the subject, you assume to be common knowledge. If in doubt about the readers' competence at any point, take the time to define and explain.

Many reasons exist for too much detail, and almost all stem form writers' inability to edit their own work. When you realize that something is irrelevant to your discussion, discard it. It hurts, but the best writers will often throw away thousands of words, representing hours or even days of work.

Remember that the function of this section is to discuss or describe the main business of the report. It naturally therefore contains the data in an organized form, often in tables. The analysis of data which are arranged in a logical order yields results and admits of certain inferences. These are then evaluated and judgments are formed and they ultimately lead to the formulation of conclusions.

Since this section constitutes the bulk of the report almost all illustrations find a place in it, when the data are too numerous or the illustrations too detailed and are likely to impede the blow of discussion of elucidation, they are included in the Appendix. Only a reference to them is given in this part.

(c) Summary

Many technical papers are not argumentative. They simply present a body of information that the reader needs or will find of interest. Frequently such reports end with summaries. In a summary, you condense for your readers what you have just told them in the discussion. Good summaries are difficult to write. At one extreme, they may lack adequate information at the other they may be too detailed. In summary, you must pare down to material essential to your purpose.

In general, each major point of the discussion should be covered in the summary. Sometimes you may wish to number the points for clarity. The following from a paper of about 2,500 words, is an excellent summary:

> The exploding wire is a simple to perform yet very complex scientific phenomenon. The course of any explosion depends not only on the material and shape of the wire but also on the electrical parameters of the circuit. An explosion consists primarily the three phases:
>
> 1. The current builds up and the wire explodes.
> 2. Current flows during the dwell period.
> 3. "Post-dwell conduction" begins with the reignition caused by impact ionization.

These phases may be run together by the circuit parameters.

The exploding wire has found many uses. It is a tool in performing other research, a source of light and heat for practical scientific application, and a source of shock waves for industrial use.

Summaries should be concise, and they should introduce no material that has not been covered in the report. You construct a summary as you construct an informative abstract. You read your discussion over, noting your main generalizations and your topic sentences. You smoothly blend these together into a paragraph or paragraphs. If you are working with word processing, you might do well to copy the material you are summarizing and then go through it eliminating unwanted material to make your summary such a technique may be both easier and more accurate than replaying the material.

Conclusion

Some technical reports work toward a conclusion. They ask a question, such as 'Are nuclear power plants safe?' present a set of facts relevant to answering the question and end by stating a conclusion: 'Yes', 'No' or sometimes, 'may be'. The entire report aims squarely at the final conclusion. In such paper, you argue inductively and deductively. You bring up opposing arguments and show their weak points. At the end of the report, you must present your conclusions. Conclusions are inferences drawn from the factual evidence of the report. They are the final link in your chain of reasoning. In simplest terms, the relationship of fact to conclusion goes something like this:

Facts	Conclusion
Car A averages 25 miles per gallon.	On the basis of miles per gallon,
Car B averages 40 miles per gallon.	Car B is preferable.

Recommendations

A conclusion is an inference. A recommendation is the statement that some actions should be taken. The recommendation is, of course, based upon the conclusions and is the last step in the process.

Many reports such as feasibility reports, environmental impact statements and research reports concerning the safety of certain foods or chemicals are decision reports that end with a recommendation. For example, government recommendations have removed certain articles sweeteners from the market and that have placed warnings on cigarette packages. These recommendations were all originally stated at the end of reports looking into these matters.

Recommendations are simply stated. They follow the conclusions, often in a separate section and look something like this:

Based upon the conclusions reached,we recommend that our company

- Not increase the present level of iron enrichment in our flour.
- Support research into methods of curtailing in flour containing wheat germ.

Frequently, you may have a major recommendation followed by additional implementing recommendations:

Major recommendation: We recommend that the Department of Transportation build a new bridge across the St. Croix river at a point approximately three miles north of the present bridge at Hastings.

Implementing recommendations:

- The Department's location engineers should begin an immediate investigation to decide the exact bridge location.
- Once the location is pinpointed, the departments right of way section should purchase the mecessary land for the approaches to the bridge.

them. You need not support your recommendations when you state and in the conclusions leading up to the recommendations. It is likely, of course, that a full-scale report will contain, in sequence, a summary, conclusions and recommndations.

4.3.3.3 Documentation

Notes (contextual/foot notes)

a. If the number of references is very small, the works may be mentioned at the bottom of the concerned page in the form of foot-notes. Attention to them should be drawn by placing a number or a symbol (1 or *) at suitable places in the text. In a footnote, the full name of the author (s) is given and the details of notation are separated by commas as shown below:

R.H Robins, 1971, General Linguistics: An Introductory Survey Second Edition, London: Longman Group Ltd. Page 2

b. **Bibliography**

A bibliography is a list of sources consulted. It is serially numbered and the entries in it are made in the alphabetical order. The details appear in the same sequence as in the list of references. There is however no reference to a specific page number. Sometimes a bibliography may ne annotated or selected. Occasionally a list of works on the same subject suggested for further readings is also termed as bibliography.

Now, we give below a few examples of entries as they would appear in the list of References/ Bibliography:

i. **Book with two authors**

Clark, W.C. and R.E. Munn. 1987. Sustainable Development of the Biosphere. Cambridge: Cambridge University Press (Note: If there are three or more authors, only the name of the first author as shown above is mentioned and the words *et al* are added after it.)

ii. **An easy/paper/article in an anthology**

Foster, E.M "An Awful Prospect" in Twentieth century Prose. 1965. A.C. Ward. London: Longmans, Green and Co. Ltd.

iii. An article/paper in a journal

Hahn, Cora. "Trial and Error" in Englishs Teaching Forum, Volume XXV, Number 3, July 1987, PP. 8-11 Wasington.

iv. An unpublished work

Banerji, Meeta. 1984. An Approach to Syllabus Design in English Language Teaching at the Undergraduate Level in India. Ph.D. Thesis. Unpublished. Pilani: Birla Institute of Technology and Science.

c. Appendix

Appendices (pl.), as the name implies, are materials appended to the report. They may be materials important as background information or needed to lend the report credibility. But they will not in most cases be necessary to meet the major purpose of the report or the major needs of the audience. For example, if you are describing research for an executive audience, they will likely be more interested in your results and conclusions than in your research methodology.

But suppose you had a primary audience of executives and a secondary audience of your fellow experts. You could satisfy both audience by placing a detailed discussion of your methodology in an appendix. Like most decisions in technical writhing, what goes into the body, what goes into the appendix and what is eliminated all together are determined by your audience and purpose.

During the final stage of arranging your report, determine whether materials such as the following should be placed in appendices: case histories, supporting illustrations, detailed data, intermediate steps in mathematical computation, extended analysis, etc.

Before you place anything in appendix, consider the effect on the report. Be certain that shifting an item to an appendix does not undermine your purpose or prevent the reader from understanding major points of the report.

Exercise

Suppose you have recently attended a conference. Write a report.

Imagine that you have made a field trip. Write a report for your co-workers.

For a project, you are currently working on write a background statement of your report for an audience that is knowledgeable about the project.

For the project you are working on write the conclusion and recommendations sections of your report.

Prepare a report on a subject at your place of business which requires direct observation, interview and assembling of data. Weave the information into a technical report with abstract, introduction, headings and conclusions.

Your company is interested in adding e-mail capability. Prepare a brief report providing this capability.

Assuming that you are the Regional Representative of Central Institute of Environmental Studies, Kathmandu, write a report to the Director of the Institute on the problem of air pollution in an urban area of your region. You should make specific recommendations to minimize air pollution.

Nepal Electronics Ltd., Kathmandu, Nepal is considering a proposal to establish a television manufacturing factory at Chitwan. Some of the factors that would influence their decision are manpower, transport, market, climate, construction cost, education, etc. You, as a senior electronics engineer, have been asked to study the suitability of this town for the establishment of the factory. Write a report for the Managing Director, incorporating the results of your study.

As Personnel Manager of Dynamic Tools Manufacturing Co. Ltd. Pokhara, you have been deputed to investigate the causes of frequent strikes in the factory and to suggest preventive measures. Write a brief report incorporating your findings and recommendations.

10. Prepare a cover page, summary and conclusions of a report on role of technical education in Nepal to be submitted to the Ministry of Education.

11. As a Personnel Manager of Dynamics Tools Manufacturing Co. Ltd. Teku, Kathmandu, you have been deputed to investigate the causes of frequent strikes in the company's factory at Ring Road and to suggest preventive measures. Write cover page, title page, preface and acknowledgement of your report.

12. Assure that you are the chairman of a committee appointed by the president of the Employees' Union of your company to look into the complaints against the functioning of the canteen on the premises and suggest measures for improvement. Prepare only the body part of your report.

13. The Institute of Engineering has decided to construct a new girls' hostel in the campus premises. As a superintendent sir, prepare cover page, title page, table of contents, acknowledgement and the conclusion of the report that you are going to submit to the Dean's office.

14. Suppose you are the chairman of the committee formed to explore the causes of damage and loss of the books in the central library, TU. Write the body part of your report.

15. Imagine that you are the chairman of a newly formed committee for studying the causes of road accidents in the highways of Nepal. Prepare title page, table of contents, abstract, acknowledgement and findings of the report which you are going to submit.

16. Suppose you are the chairman of a commission for studying the problem of electric supply in Nepal. Write only the following parts of the report:
    a. Title page
    b. Acknowledgements
    c. Abstract
    d. Table of contents

17. Prepare a cover page, conclusion and recommendations of a report on "Damages and Loss of Life during Rainy Season in Nepal".

18. Imagine that you have carried out a research study on the causes and consequences of deforestation in the hilly regions

of Nepal. Write title page, acknowledgement, abstract and recommendation parts of your report.

You are asked to prepare a report on "Price Hike in Nepal." Write only the following parts of that report:

a. Preface
b. Acknowledgement
c. Conclusion

Imagine that Government of Nepal has formed a committee under your chairmanship for the purpose of studying the effect of noise pollution in the industrialized towns in Nepal. Write down the title page, table of contents and the recommendations sections of the report that you are going to submit shortly.

Write a progress report. The subject of this report can involve a project or activity at work. Or, if you haven't been involved in Job-related projects, write about the progress you're making in this class or another course you're taking. Write about the progress you're making on a home improvement project (refinishing a basement, construction a deck, painting and papering a room). Write about the progress you're making on a hobby (rebuilding an antique car, constructing a computer, or making model trains, etc). Whatever your topic, first rewrite (using branching), then write a draft and finally post-write revising the text. Abide by all the criteria presented in this chapter regarding progress report.

Write a feasibility report. You can draw your topic either from your work environment or home. For example, if you and your colleagues were considering the purchase of new equipment, the implementation of a new procedure, expansion to a new location, or the marketing of a new product, you could study this idea and then write a feasibility report on your findings.

As a class take a field trip. Visit a publishing firm, see a play, go to a museum, hear a guest speaker on campus, or interview a professional technical writer, for example. Then in small groups write a trip report about observations.

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