NEWSLETTER

Operational Research Society of New Zealand (Inc.)

THE UNI

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Operations Research at Australian Gas Light Co. Miss V. Stewart

Correspondence

Council Notes

Dr Richard Bellman

New Members

News Briefs

Bellman Dinner

28.4.71
MJT/JCS

OUTLINE OF TALK TO NZORS 8.3.71

OPERATIONS RESEARCH AT A.G.L.

The Australian Gas Light Company was inaugurated in 1837 and commenced distribution of gas in 1841 making it the oldest industrial undertaking in Australia. It is a privately owned company and competes successfully though on unfavourable legislative terms with the stateowned electricity commission. A.G.L's continued existence as an economically visable entity is due to the enlgghtened management and their ready acceptance of the most up-to-date management techniques available.

An Operations Research Group was formed at A.G.L. in mid 1957. Since that time the group has assisted Management continually by investigation of alternative courses of action in all phases of Company planning.

Our experience at A.G.L. would seem to indicate that some requisites for a successful Operations Research Group are:

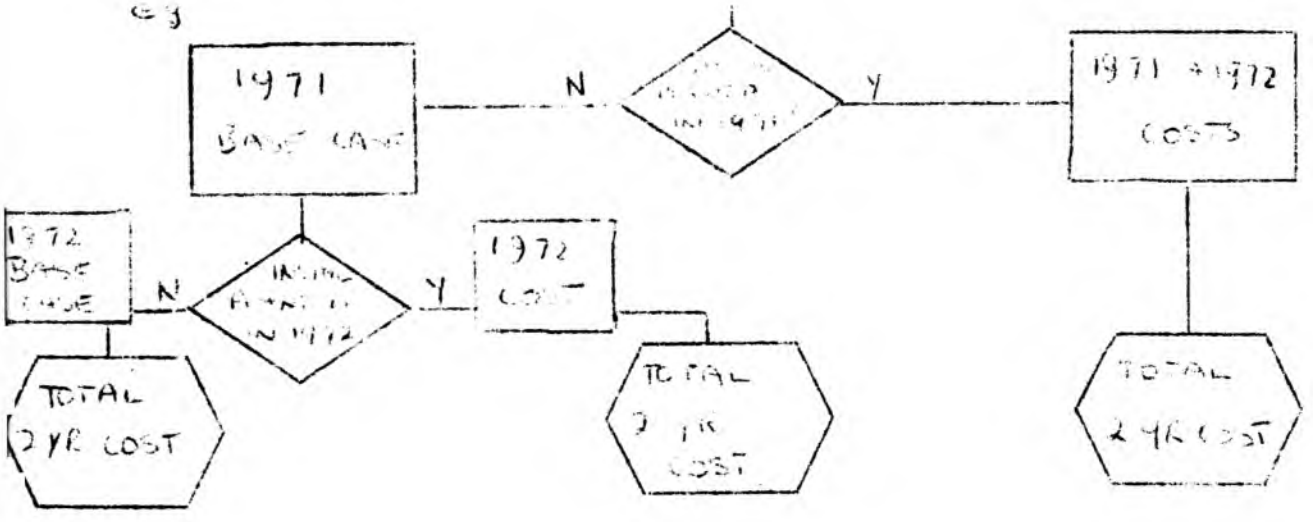
1. An initiator of ideas - a man with enthusiasm and vision to lead the group.

2. The understanding by Management of the potential results obtainable.

3. Some obvious successes. The first project undertaken needs to be one where savings can be demonstrated indubitably. This gives the group and management confidence in each other.

4. Access to a computer. Although not essential it does enable answers to be obtained more speedily than would otherwise be the case and of course many problems involving repetitive calculations would not be tackled were it not for the computer.

Given the above, it is nevertheless important to continually strive to present information to management in as clear a manner as possible. Accordingly we frequently use decision diagrams in order to present all alternatives and their associated costs.



At a glance management can determine the cost (or difference in costs) of various alternatives and then make their decision from there,

Linear Programming

Linear Programming has been used almost continually since the inception of the O.R.Group. This is because A.G.L. has a classical blending problem with the need to make a final product from several widely different components manufactured in several dissimilar plants.

Unlike the 'nameless flameless'fuel, gas has the inherent advantage of being able to be stored, and hence plant is required to meet not an instantaneous peak, but a peak week.

Planning is therefore normally on a 52-week basis but use of an LP incorporating all relevant data for the full 52 weeks would lead to a problem too big to be solved on the computer currently installed at A.G.L. Accordingly a compromise is used whereby the year is divided into 8periods such that within each period reasonably similar conditions apply. Experience has shown that such an L.P. is small enough to enable the O.R. Analyst to retain a 'feel' for the solution and yet big enough to produce a usable result.

Critical Path Scheduling

In addition to the use of critical path scheduling for the normal construction type of project some experience has been had in using CPS for reducing the down time as well as the overtime on plants taken off line for maintenance.
The aim is to shorten the down time till the cost of further reduction just equals the value of the plant online. An initial C.P.S. run is made using the best information available on the condition of the plant and bearing in mind previous maintenance experience. Once the plant has been taken offline, a revision may be required if the condition of the plant varies widely from the original assumption. Some overtime may then need to be scheduled on.

CRITICAL PATH RESOURCE ALLOCATION

During the March meeting of the Society a description of resource allocation following the use of the IBM package program Project Control System (PCS) was given. This was a manual system as PCS does not include allocation of resources.

An investigation suggested at the meeting shows that this could be done by the computer in question by one of three programs.

1. A program called REAL (resource allocation) could be used as a post processor of PCS output.

2. A system called PMS (project management system) which includes a network processor and a resource allocation processor could be used for the whole job.

3. The ICES (integrated civil engineering system) package includes a sub-system called PROJECT which could also do the complete analysis.

In the circumstances REAL (prog. no 5736-XP2) is probably the best to use as there would be no changes to be made to the current system. REAL Can handle up to 5000 activities, 20 resources with up to 4 resources per activity.

PAUL BIELESKI

(I.B.M LIMITED)

COUNCIL NOTES

Following the scheme introduced in 1970 the newly elected council has formed a series of committees in order to give greater participation to non council members in the running of the society.

This year some committees have representatives in centres other than Wellington in order to give new and potential members more direct contact with the council.

The 1971 committees are:

1. Education Committee

   This Committee is charged with the responsibility of advising and assisting in the planning of any proposed courses or seminars on O.R. and indicating those courses which should receive society recognition. To make available information, training aids and suitable texts and materials for such courses, and to assist in educational functions organised by the Society itself.

   The members of this Committee for 1971 are:

   Mr John Jordon (Chairman), Mr Barney Slocome (Auckland)

2. Programme Committee

   This Comittee is responsible for organising all the meetings held, arranging speakers and venues and organising the annual conference. In addition it is responsible for research into ways of extending the scope of the present programme activities such as society run course, visiting overseas speakers, meetings in other centres etc.

   This year the Committee comprises:

   Mr Dave Cook (Chairman), Mr Andre Milkop Mr Mike Tarrant (Wellington) Mr Tim Lusk (Christchurch)

3. Publications Committee

   The duties of this Committee are to arrange reporting, editing, publishing and distribution of the Newsletter, and conduct research into ways of improving the service to members by way of published material.

   The Committee is:

   Mr Mike Tarrant (Editor), Mr Chris Kirkham, Mr Lester O'Brien (Wellington)

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4. International Committee

This Committee is responsible for keeping N.Z.O.R.Soc.in liaison with I.F.O.R.S. and providing abstracts of papers for the International Abstracts.

The Committee members are Professor Fraser Jackson (Chairman), Professor Tony Vignaux (Wellington) Mr.Derek Johanson (Tokoroa)

5. Membership Committee

Responsible for obtaining new members and investigating the eligability of potential full members of the Society and any new membership class such as corporate membership.

The committee is:

Dr Hugh Barr (Chairman), Mr Dick Wheeler,(Wellington)
Mr Tim Lusk (Christchurch).

6. Public Relations Committee

This Committee is responsible for making both the general public (via newsmedia) and Business firms aware of the activities of the Society to expand the general appreciation of what O.R. is and does.

Members are: Mr Lester O'Brien (Chairman)

All of the above committees require some finance in order to run the activities of the society efficiently. This year the major 'spenders' will be Publications ($150), Programm ($160) and International ($90). As can be seen from the outline of the Committee activities practically all of this is returned to members via activities such as Newsletters, I.F.O.R.S., abstracts, annual conference and meetings.

DR RICHARD BELLMAN

The famous'inventor' of Dynamic Programming, Dr Richard Bellman will be visiting New Zealand for three weeks from the 17th May 1971.

The visit is jointly sponsored by:

The Fullbright Foundation
The University Vice Chancellors Committee
The DSIR
The New Zealand Electricity Department

Dr Bellman will be present at the 6th New Zealand Mathematics Colloquium at Victoria University of Wellington from 17 May to 20 May.

While at the Colloquium he will have discussions with members of D.S.I.R. The following week Dr Bellman visits the Post Graduate Electrical Engineering Research School at Centerbury University and in the third week visits the Medical School at Otago University to put them in touch with recent developments in the application of Mathematics to Medicine.

Dr Bellman holds three chairs at the University of California in Mathematics, Medicine and Electrical Engineering. He was recently awarded a substantial prize by the American Mathematical Association for outstanding contributions to mathematics. His research work at the Univesity of California has received a $2,500,000 grant for continuation of work in the application of mathematics to medicine.

He is a prolific writer having written some 20 books and a very large number of papers. His visit will indeed be a memorable occasion for the N.Z. Operational Research Society.

NEW MEMBERS

The following new members have been accepted into the Society:

David J. Gilbert	-	V.U.W. MSc Student
Jeffrey F. Lowinger	-	C.U. PhD Student
Robert B. Davies	-	D.S.I.R.
David J. Bull	-	N.Z.E.D.
Nevil Cooper	-	N.Z. Gas Council
David M. Beggs	-	Research Office
Jillian E. Barker	-	Shell Oil
William F. Moxon	-	N.Z.E.D.
Thompson Winiata	-	N.Z. Dairy Board
David Vere - Jones	-	V.U.W. Prof. of Mathematics
Richard Laing	-	Dom. Life Ins. Co.
Michael O. Camden	-	Statistics Department
William P. Foster	-	N.Z. Post Office
Kathleen M. Watson	-	D.S.I.R.

The following have accepted full membership.

Mr P.J. Dohrn, Mr J. Jordon, Mr B. Campbell, Mr A. Milkop, Mr M. Palmer, Dr R. Allan.

NEWS BRIEFS

Mr Bernard Kaiser has tendered is resignation to the Society and it is accepted with great regret. Mr Kaiser has had long association with council activities and was a member of the 1971 Council. Council have co-opted Mr Lester O'Brien to take over the Public Relations committee from Mr Kaiser.

Tony Vignaux - Society president, has just returned from his world trip and we are looking forward to having comment from him in the next news letter.

BELLMAN DINNER

It is still not to late to obtain tickets for the cocktail - dinner in honour of Richard Bellman. Just fill in and return the enclosed application form together with $5 and a ticket will be returned forthwith.

The program for the evening is 5.15 - 6.15 - Cocktails
6.15 - 7.30 - Buffet style Dinner with 9 food options.
7.30 - 9.30 - Address by Dr Bellman.

MT/UB

6TH NEW ZEALAND MATHEMATICS COLOQUIUM

OPERATIONS RESEARCH DAY

Venue: Victoria University, Wellington

9.00 a.m.	Registration (no fee) a. Distribution of name tags b. Distribution of information
9.30 a.m.	Dr H.G. Daellenbach (University of Canterbury) "Optimal High-Speed Runway Exit Location"
10.15 a.m.	Morning Tea and Coffee
10.45 a.m.	Dr R. Bellman (University of Southern California) - a topic relating to Dynamic Programming in Operations Research
12.00 noon	Lunch
1.30 p.m.	Mr I.D. Dick (Mines Dept). A survey of O.R. applications with general conclusions on O.R. work drawn from experience.
2.45 p.m.	Afternoon Tea
3.15 p.m.	Mr J.A. George (University of Canterbury) "A iterative procedure for decomposition of an Integer programme"
4.00 p.m.	Session ends at University
5.15 p.m.	Dinner Function with Dr R. Bellman speaking at the Overseas terminal. Tickets for this function are available on return of the form attached. An immediate reply is requested.

Dr Richard Bellman

Cocktail - Dinner Evening

Thursday 20 May 1971

Overseas Terminal - Wellington

5-15 to 9-30

Guest Speaker Dr Richard Bellman - University of Southern California

Please forward to the address below ..... tickets for the above function. Enclosed is a remittance of $5 per ticket.

My address ..... Name

.....

.....

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Reply to the Chairman, Program Committee
N.Z.O.R.S.,
P.O. Box 904,
WELLINGTON

MJT/AHMB