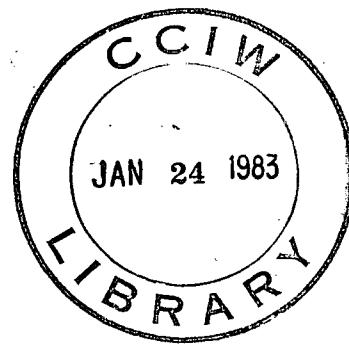


HYDRAULICS DIVISION

Technical Note



DATE: January 1983

REPORT NO: E82-12

TITLE: Comment on the Unsolicited Proposal Entitled "Mooring Dynamics Recorder" UP-M-400, submitted by M.S.E. Engineering Systems Ltd.

AUTHOR: F.E. Roy

REASON FOR REPORT: In response to requesting letter, CR File 1632-2, dated 4 January 1983, to A/Director, NWRI, from program Assistant, Office of Research Subventions, IWD.

SUMMARY: It is concluded that the proposal has little relevance to NWRI needs, and recommended that it not be supported by NWRI. It is further recommended that the proposal be examined by various Institutes of Ocean & Aquatic Sciences, D.F.O., where it may better fit their studies.

CORRESPONDENCE FILE NO: 1632-2

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION	1
2.0 SCIENTIFIC/TECHNICAL MERIT	1
3.0 RELEVANCE TO NWRI RESEARCH	2
4.0 PROPOSAL CONTENT	3
5.0 CONCLUSIONS	3
6.0 RECOMMENDATIONS	4

APPENDIX I

1.0 INTRODUCTION

The requesting letter (Appendix 1) from the Office of Research Subventions, Inland Waters Directorate, provided a copy of an Unsolicited Proposal entitled "Mooring Dynamics Recorder, UP-M-400", submitted by MSE Systems Engineering Limited. This letter invited comments concerning the scientific merit of this proposal, its relevance to NWRI interests, and NWRI ability or willingness to provide supporting funds.

The following comments are submitted based on a review of the proposal and idea it represents.

2.0 SCIENTIFIC MERIT

Underwater mooring for various water property sensors may vary greatly in complexity from a single taut wire on a subsurface buoy to multi-leg multi-buoy configurations.

Simpler configurations have been analyzed and simulated by computer modelling techniques, to assist design and to estimate the dynamical behaviour of the sensors on the mooring line under various conditions of current and surface wave condition.

This approach is not so productive with more complex moorings, where observation of interactions between elements is not readily available.

The scientific merit of the Mooring Dynamics Recorder (MDR) rests on its ability to measure and record in situ data on mooring line dynamics. Such data might reasonably assist in the analysis and modelling of complex mooring configurations.

The significance of this depends on the scientific studies being done.

In terms of hardware development, the proposal does not embody new scientific approaches or develop new areas of technology, and therefore, does not have any particular scientific or technological merit. Rather, it takes existing hardware and technology and combines them in a package with minimal technological development to generate a marketable product.

The only area of technological development appears to be the controller which will give the ability to record only those events of interest thus extending the duration of the available tape capacity.

The export value of the product is minimal, since all the major components are imported from the U.S. The market size for the product is small and will not encourage the development of skills by potential Canadian sources of major components for production.

At best, the money invested in this development will teach a small manufacturing/assembly group the skills and quality levels necessary to design equipment for the offshore environment. This may encourage the development of a Canadian-based technology in the design and manufacture of oceanographic and limnologic instrument systems, which may be an important factor in assessing the merit of the proposal.

3.0 RELEVANCE TO NWRI RESEARCH

In limnological instrument moorings, mooring depths are usually less than 100 m, currents are usually small, and in general, single string taut wire moorings are adequate. Sensor positions are generally predictable within the accuracy required. The MDR has only limited relevance to NWRI needs in this application.

The instrument may have application in other studies at NWRI involving mooring dynamics, e.g., mooring forces in floating structures, data buoys, tower guys, towing forces, forces on ice booms or oil skimming booms. Instruments currently used in these types of study comprise underwater tensiometers with signal cables to recorders on shore or in surface buoys.

The proposed unit has the advantage of being fully self-contained, and the disadvantage of being more costly and not accessible for monitoring during long deployment periods.

The MDR in the context of NWRI needs must be categorized as "nice to see or try, but not essential", especially in this period of fiscal restraint.

4.0 PROPOSAL EVALUATION

4.1 The proposal is quite feasible and has merit in the application to which it is directed.

4.2 The effectiveness of the MDR depends on its reliability over a mission duration of up to 12 months, without monitoring capability. It is expected that the largest problem of development will be the achievement of this order of reliability. The proposal makes no mention of any reliability engineering analysis during the design stage, recognition of the need for special quality control on parts or procedures, or statistical testing of prototypes to determine potential reliability or modes of failure.

This area should be examined more closely since it could be the largest source of cost and schedule over run.

4.3 The largest effort for the user of recorder based instrumentation is the data recovery and analysis. The proposal says that MSE will provide tape reading/translation, but provides no discussion of the nature or format of the data product.

If the instrument is successfully developed, the data recovery part of the system would constitute a large opportunity for MSE to develop its system engineering capability, as well as a good market for data recovery hardware and software.

The development proposal should include some information as to how this element of the system is to be dealt with.

5.0 CONCLUSIONS

5.1 The idea of a Mooring Dynamics Recorder for application to complex mooring assemblies is sound and feasible.

- 5.2 The scientific merit of the proposal is of a low order since it is of only limited application and does not utilize any previously underdeveloped scientific principal.
- 5.3 The technological benefit of support is primarily to encourage the development of a Canadian based technology in the design and manufacture of oceanographic and limnologic instrument systems. This benefit is minimal in this case, since the development merely takes existing foreign designed and produced hardware and packages it with little modification for a particular application.
- 5.4 The export value appears to be small since all the major components are imported from the U.S. with less than half the value added from Canadian sources.
- 5.5 The proposal has only small relevance to NWRI research needs.
- 5.6 The proposal is weak on detail description of anticipated development problems, does not recognize the major problem of reliability, and does not deal adequately with the data recovery aspects of the system design.

6.0 RECOMMENDATIONS

It is recommended that NWRI should not support this proposal on the ground that it does not have relevance to NWRI studies at present.

It is recommended that the proposal be examined by Ocean and Aquatic Sciences, D.F.O., in Burlington, I.O.S., Patricia Bay, B.C., and Bedford Institute of Oceanography, where it may have more relevance to their studies.

APPENDIX I



TO: A/Director, NWRI

FROM: Program Assistant
Office of Research Subventions
Inland Waters DirectorateSUBJECT
OBJETUnsolicited Proposal submitted by M.S.E. Engineering Systems Limited
entitled: "Mooring Dynamics Recorder" (UP-M-400)

FILE	1632-2
No.	
DATE	Jan 4/83
TO	In 163 7
	DAB MB 5/1/83
HD	
CR	

SECURITY - CLASSIFICATION - DE SÉCURITÉ
OUR FILE / NOTRE RÉFÉRENCE
YOUR FILE / VOTRE RÉFÉRENCE
DATE December 29, 1982

JAN - 5 1983

Please find attached a copy of the above unsolicited proposal which may be relevant to the research activities or interests of your program. We would appreciate your comments concerning the scientific merit of this proposal, its relevance to your interests, etc., and also your ability or wish to provide funds for it either totally or in part. If you cannot respond favourably, or feel that the submission should be sent elsewhere for consideration, please advise us.

DSS will be arranging a meeting to discuss this proposal. If you support this proposal and wish to attend the meeting, or to be represented by a member of your staff, please let me know so that DSS can be advised.

Since DSS requires a reply in the near future, may we please have your comments as soon as possible, and by January 26 at the latest.

Thank you.

Pat Houston

Patricia Houston

Attach.

c.c.: A.C. Lachance
D.A. Bondy

JAN 6 1983