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Smart Project Appraisal Form

Reference: 1939

Applicant: Satellite Propulsion Research

Project Title: Development of a Microwave Engine for Satellite Propulsion

Advice Required From: Momenta

Your Role

You are asked, along with others, to make a recommendation to a judging panel on whether, in your opinion, the project proposal should be supported. You are not being asked to make a final decision, nor are you expected to take the role as the final arbiter. You are asked to indicate in the High/Low rating how you perceive the project in terms of the criteria indicated in the marking frame. It would be appreciated if you would add to this rating with a brief explanatory text in the comments section. You should bear in mind your comments could be revealed under the rules for Open Government on rare occasions.

If you do not have any background knowledge in the technology requested please either return this Form to me or forward it to a suitable colleague and notify me of your action

Please complete this form putting a tick in the box you consider is the most appropriate for the proposal attached. **AND please comment on each aspect - your comments have great value to us as the project may be finally judged by someone without a technical background**. If you have no knowledge of the subject area can you suggest an alternative source, if possible.

(Delete ✓ where appropriate)

RATING → HIGH 5 4 3 2 1 LOW		
INNOVATION Technically new in world terms; involves T/T from recent research	✓	New only to the firm concerned; trivial & low risk technology
Please indicate how the proposal differs from existing technology: The proposal offers a technology which directly converts energy into thrust using a novel design of microwave cavity. The proposed performance would not be efficient in its use of power, but as it requires no propellant would be extremely weight efficient over time, given plentiful supplies of electricity. As electric power is plentiful in space, and weight is prohibitively expensive, this innovation would act as an ideal satellite manoevering and stationing thruster.		
ASSESSMENT OF TECHNICAL RISK Clear and realistic technical objectives. Challenging Research Programme	✓	Technical objectives unclear or impractical. Little or no technical risk

RATING → HIGH 5 4 3 2 1 LOW

How do you rate the applicant's chances of achieving the technical objectives?:

The applicant presents refereed technical results from a SMART feasibility project which indicate that the innovation does indeed provide thrust. He has attempted different experimental configurations to eliminate any spurious effects. I would note that experiments of this nature are extremely difficult to perform, due to the many interfering effects that can occur.

Given the thoroughness of the attempts to deal with spurious effects, I would be inclined to take the report as positive, if it were not for my severe concerns over the basic principles of operation of the thruster. As I mentioned in my previous assessment, I am not suitably qualified to fully technically assess the principles, but have a general scientific understanding. This leads me to suggest that the applicant has managed to confuse his theoretical workings, and calculated a net thrust in a system which should not be capable of generating it. In particular there seem to be several assumptions which do not have adequate explanation.

This proposal maintains the original concerns which I had in the original feasibility assessment of 19th June 2001, and it needs to be assessed by a qualified physisist before any further funds are invested, one of whom I recommend later.

RATING → HIGH 5 4 3 2 1 LOW	
COMMERCIAL NEED Strong need in world markets ✔	Sales depend on stressing technical or other novelty

Please explain how the proposed end product differs from what already exists in the market:

Existing satellite positioning products require a propellant to generate thrust. This propellant must be carried into orbit, at prohibitive cost. In addition, the limited supplies which must be carried limit the lifetime of the satellite, which could otherwise operate to the limit of the longer systems life.

ENVIRONMENTAL IMPACT The project will have a beneficial impact on the environment; sustainable technology ✔	Potentially adverse environmental impact

What will the impact be (if any)?:

Reduction in launcher energy and pollutant impacts.

DESIGN IMPACT The project shows awareness of good design practice; enhances the applicant's design effectiveness and project value. ✔	Design not considered; adds no value to the applicant's project

What will the impact be (if any)?:

Design is crucial in this form of innovation, bu this may not be the issue at stake.

DO YOU KNOW THE APPLICANT? Yes No ✔

⇩

If "Yes" please include a view on the competence of the applicant to carry out the project in your comments below

With the information you have, would you recommend Support Rejection ✔ **of the Smart proposal.**

If you have any other comments relevant to the proposal or to your recommendation please add them here:

This innovation requires a proper microwave physics-based assessment. I have investigated this issue thoroughly and would recommend Deptartment of Electrical Engineering, Imperial College of Science, Technology and Medicine, South Kensington, London SW7 2AZ.

Please indicate your knowledge or expertise in the subject area	
Recognised world/national/sector expert or practitioner	
Over 5 years practical knowledge of the subject area	
Less than 5 years practical knowledge	
No practical knowledge of the subject, but some policy or related knowledge	✔
New to the subject area with limited or no knowledge. If you have ticked this category can you suggest an alternative source, if possible:	

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Name of person who completed the form:	
Directorate / Establishment	Momenta
(Direct) Telephone No:	

We do appreciate the time and effort you have put into this proposal. Do you wish to be kept informed of progress on the application and project if approved? Yes ✔ No

Please return the form to: [redacted]