AUSTRALIAN RESEARCH GRANTS SCHEME

APPLICATION FOR INITIAL SUPPORT IN 1987

I

APPLICANTS MUST CONSULT THE DOCUMENT "ADVICE AND INSTRUCTIONS TO APPLICANTS" BEFORE COMPLETING THIS FORM

Office use only	File No.

P. P.

1. **INSTITUTION TO ADMINISTER PROJECT**
University of Wollongong

2. **PROJECT TITLE** *(Precise informative. Up to four lines; do not break words at end of line. Maximum of 38 characters per line.) CAPITAL LETTERS*
The vulnerability of some key Australian technological systems to military threats

3. **TOTAL FUNDS FOR 1987 REQUESTED IN THIS APPLICATION** *(Whole dollars only; final figure in right-hand end square)* $ 58359 GROUP A2 CATEGORY 733 *(See Instructions for codes)*

APPLICANTS Chief Investigators *(see Instructions)*	1	2	3
4. Title, Initials and Surname *(Show Prof/Assoc Prof/Dr/etc)*	Dr B Martin		
5. Full address	Department of History and Philosophy of Science University of Wollongong, POBox 1144, Wollongong NSW 2500 Telephone: (042) 270763 Telex: 29022	Telephone: Telex:	Telephone: Telex:
6. Appointment held	Lecturer		
7. Department/school/other *(Please indicate which)*	Department of History and Philosophy of Science		
8. Year of birth	1947		
9. Gender	☒M ☐F	☐M ☐F	☐M ☐F
10. Academic qualifications. Indicate conferring institutions and dates.	BA, Rice University, 1969 PhD, Sydney University, 1976		
11. Average days per month to be devoted to the project.	6		

12. Indicate whether you are also applying for 1987 support from:

	MST Grants Scheme	NH & MRC	NERDDC	Other
If "YES" state project title and amount requested on page 3.	YES☐ NO☒	YES☐ NO☒	YES☐ NO☒	YES☒ NO☐

13. (a) Does the work proposed involve human or animal experimentation? YES☐ NO☒

(b) Does the work proposed involve experiments involving the preparation or use of recombinant nucleic acids constructed *in vitro* from sources which do not ordinarily recombine genetic information? YES☐ NO☒

(c) Does the work proposed involve the use of ionising radiation? YES☐ NO☒

If "YES" to (a), (b) or (c), please sign the additional certification, overleaf.

14. Has the project started? YES ☐ NO ☒ If "NO", when can it start? When appointment of RA made What is the probable duration of need for support? 2☐ years

15. You may give names and addresses of up to 3 persons qualified to assess your project by completing a separate Assessors Nomination form which is available from your institution. An original and four copies (only) of the Assessors Nomination form are required.

16. (a) Indicate any anticipated period of absence from institution during the course of the project.			
(b) Indicate any anticipated period of absence on Outside Studies Program.			
17. What other major research programmes are being undertaken or closely supervised by the Chief Investigators?	Comparative study of the social and institutional entrenchment of different technologies (nuclear power, automobiles, television).		

TK8
Jan 86

ALL ENTRIES ON THIS FORM SHOULD BE TYPED CLEARLY USING A BLACK RIBBON

OTHER PROJECT INFORMATION

18. Indicate, using the symbols I and R those grant years for which you have received Initial and Renewal ARGS support.

	File number and brief title	1981	1982	1983	1984	1985	1986
This project							
Other ARGS projects							

19. Except for any special items needed, are the necessary basic services and equipment, such as an equipped laboratory, staff workshop, secretarial assistance and a departmental maintenance or research vote available for general support of the project? YES☒ NO☐

If "NO", please elaborate.

OTHER PARTICIPANTS 20. Provide details of Associate Investigators *(see Instructions)*. List names, qualifications, dates conferred and conferring institutions Indicate involvement in the project in average days/month. Certification required below	
21. What technical and other staff (other than those requested) will be available to assist with the project? Indicate involvement in the project in average days/mth.	
22. Will there be any research students working on the project? If so, state the number, and the qualifications being sought and type of support.	

CERTIFICATION

(A) TO BE SIGNED AS APPLICABLE *(See Items 13 and 20)*

I/We understand and agree that,

(a) research which involves human or animal experimentation must be carried out in accordance with the guidelines laid down in the NH & MRC code of practice,

(b) research which involves the use of recombinant nucleic acids constructed *in vitro* from sources which do not ordinarily recombine genetic information must be carried out in accordance with the guidelines laid down by the Recombinant DNA Monitoring Committee,

(c) research which involves the use of ionising radiation must have the risks involved assessed by the institution's Ethics, Safety or Bio-safety Committee, and;

(d) a certificate of compliance with the appropriate guidelines must be received by the Committee from the institution's Ethics, Safety or Bio-safety Committee before payment of any proposed grant can be made.

..... Date:...../...../.....
Chief Investigator(s)

I/We declare that all persons listed as Associate Investigators have agreed to take part in the proposed research.

..... *Date:...../...../.....*
Chief Investigator(s)

(B) TO BE SIGNED FOR ALL APPLICATIONS

Signature(s) of Chief Investigator(s) (1) Brian Martin Date: 26 / 3 / 86

(2) ..../...../.....

(3) ..../...../.....

Certificate of Head of Department *(See Instructions on Item 19)*

(Heads of Department are requested to either sign the certificate below or to forward a confidential statement.)

I certify that the project is appropriate to the general facilities in my Department, that sufficient working and office space is available for any proposed additional staff and that I am prepared to have the project carried out in my Department.

Signature..... Date 26 / 3 / 86

Head of Institution (or Nominee)

I certify that the project is acceptable to the institution and the salaries quoted for personnel are in accordance with the practices at this institution.

Signature..... Date...../...../.....

Designation.....

(SEE INSTRUCTIONS FOR THE COMPLETION OF BUDGET INFORMATION)

DETAILED BUDGET FOR 1987			OFFICE USE ONLY	
Items	Priority	Amount requested ($)	File No.	
Personnel				
Research Associate, bottom level $23,474 + 17%	A	27,465		
Travel				
1 Wollongong-Canberra return bus fare, 3 Wollongong-Sydney return train fares + 8 days at $80.70 per diem	B1	714		
Computer searches, purchase of documents and photocopying	B2	800		
	TOTAL	28,979		

Will you be available for an interview if required *(See Instructions for dates)* YES [X] NO [ ] UNCERTAIN [ ]

ARGS Financial Support	Personnel $	Equipment $	Maintenance $	Travel $	Total $
Support requested for ... 1987	27,465	800		714	28,979
Estimates of support for ... 1988	28,266	400		714	29,380
Estimates of support for ... 1989					

KEYWORDS
Give up to five keywords to describe the subject area of proposal

1. self-reliance
2. vulnerability
3. computers
4. steel
5. electricity

PROJECT CLASSIFICATION
(Repeat as shown on Page 1)

A 2 Group

7 3 3 Category

TOTAL SUPPORT Give details of support during 1985 and 1986 (and requested or to be requested for 1987) separately for (a) this project and (b) other projects (show research field) from your own institution and from all grant-giving bodies, including the ARGS.
Complete at least one line of the table, indicating "None" where appropriate.

Details of Project / Name of Body	Amount ($) 1985	1986	1987 (Requested)
(a) Vulnerability of Australian technological systems			28,979
(b) Politics of fluoridation/University of Wollongong	None	None	?
(details yet undetermined)			

Project title: (Repeat title shown on page 1)
The vulnerability of some key Australian technological systems to military threats

ADMINISTERING INSTITUTION University of Wollongong

Surname 1st Chief Investigator: Martin

AIMS & SIGNIFICANCE

Most analysts of defence requirements support self-reliance to increase the capacity of a society to survive against external threats. Self-reliance here means such things as manufacturing capabilities, independence of imports, back-up systems, availability of local skills and decentralised systems. A self-reliant communications system, for example, will be resilient against attack against obvious central facilities. Support for self-reliance is found among those who basically agree with present defence postures and among those pursuing alternatives (see for example Ross Babbage, Rethinking Australia's Defence (St Lucia: University of Queensland Press, 1980); David Martin, Armed Neutrality for Australia (Blackburn: Dove Communications, 1984); Gene Sharp, Making Europe Unconquerable (Cambridge, Mass.: Ballinger, 1985)).

In a few countries, notably Sweden, Switzerland and Yugoslavia, significant steps towards economic self-reliance as a part of defence planning have occurred. But in Australia, as in most other countries, statements supporting self-reliance are hardly ever matched by actual performance. Within strictly military planning, there is often considerable attention to vulnerability of communications, weapons, supply routes and the like. But the wider economic and social basis for defence, such as the public communications networks, are seldom designed for resilence in the face of attack.

The aim of this project is to examine in detail the vulnerabilities and resilience of several key technological systems in Australia in the face of military attack. The three systems to be focussed on are: (1) computers, especially in their role in communications; (2) steel manufacturing; (3) electricity production. The three systems chosen are case studies within the wider systems of communications, manufacturing and energy. In looking at these specific systems the aim is to answer several questions.

* What are their critical vulnerabilities, both technical and human?
* What are the social and political factors which have inhibited the development of more resilient systems?
* What are the simplest steps to make the systems more resilient?
* What is the relation of different defence modes to the promotion of more resilient systems?

To my knowledge and that of several experts I have consulted, no detailed study of this nature has been undertaken in Australia, while overseas their are few studies looking at vulnerabilities outside of those focussing on specific military systems. For example, the Australian Department of Defence has done no detailed studies of the likely effects of nuclear war in the northern hemisphere on the Australian economy. There are some Australian studies which deal with general strategic vulnerabilities. An example is W. S. G. Bateman, Australia's Overseas Trade: Strategic Considerations (Canberra: Strategic and Defence Studies Centre, ANU, 1984), but this gives little detail on the specific systems to be addressed.

There are studies of system vulnerabilities in other countries (for example, Arthur M. Katz, Life After Nuclear War: The Economic and Social Impacts of Nuclear Attacks on the United States (Cambridge, Mass.: Ballinger, 1982); Duncan Campbell, War Plan UK (London: Burnett, 1982); Amory Lovins, Brittle Power: Energy Strategy for National Security (Boston: Brick House, 1984)) but these mostly spell out the problem that massive vulnerabilities exist. There is useful material from Sweden and Switzerland, but it does not delve into the social and political obstacles to promoting self-reliance in other countries.

Continue overleaf

RESEARCH PLAN, METHODS & TECHNIQUES, JUSTIFICATION OF BUDGET & RELEVANT PUBLICATIONS

Research plan, methods and techniques

The research plan is designed to focus intensively on three key technological systems in Australia to determine their specific vulnerabilities, the social and political reasons why these vulnerabilities exist, how they might be overcome, and how these systems relate to proposed defence modes for Australia.

The first stage is outlining several potential military threats to Australian society. These will include

* nuclear war in the northern hemisphere;
* direct nuclear attack on Australian military facilities or cities;
* invasion;
* economic blockade.

These threats will be elaborated by studying the literature on the physical, social and economic effects of nuclear war, invasion and blockade, and consulting with experts. The aim is the specific one of spelling out what these threats mean for the technological systems to be studied in detail.

The second stage, which will entail the most work, is examining in detail the vulnerabilities of specific technological systems, chosen out of the major sectors of communications, manufacturing industry and energy. The following three systems will be studied.

(1) Computers, especially in their role in communications. Communications systems are vital in societies such as Australia, and computers are increasing central to electronic communications, such as telephone, radio and television. Vulnerabilities of computer systems include direct physical destruction, disruption by electromagnetic pulse, cutoff of foreign supplies of hardware or software and killing or imprisoning service or programming personnel. To narrow the focus on computers in communications, attention will be directed to telephone and radio in Sydney.

(2) Steel manufacture. Steel is a vital component in manufacturing industry, and could well be a target for destruction or takeover by invaders. Vulnerabilities include direct attack, cutoff of replacement parts, disruption of computer-based control equipment and cutoff of electricity supplies. Steel production in Wollongong will provide a convenient location for study.

(3) Electricity generation. Electricity is vital for many activities, including telecommunications and much industry. Vulnerabilities include direct attack on generating plant (coal or hydro), disruption of transmission, sabotage of control equipment, interruption of maintenance, disruption of communications for monitoring the system and many others. The electricity system in NSW will provide a suitable case study.

In each of these cases, the main focus will be on civilian systems which provide the basis for the continuing functioning of society. Specifically military systems will be dealt with only to the degree that unclassified information about them is available. In any case, military communications, production and energy systems depend significantly on the wider infrastructures provided by civilian systems.

The study of these systems will proceed in three steps. First will be a general survey of the literature on vulnerabilities of electronic communications, manufacturing technology and energy production, focussing on the specific areas chosen within each of these. Because the material on these subjects is not easy to track down, this stage of the study will require extensive searching of diverse literatures, including computer searches.

The second step will be collection of detailed information on the

Continue overleaf

specific cases noted above. Information to be studied will include types and origins of equipment, availability of spare parts, numbers and types of technical personnel required to run the systems, the availability of backup personnel within Australia, the degree of overseas ownership and management, the capacity and readiness of backup systems, and the availability of alternative ways of accomplishing the same task. This information will be obtained from a close study of reports from relevant companies and government bodies, government statistics and technical documents. For example, the study of the steel manufacturing process will be sufficiently detailed to specify the parts of the production process which are most vulnerable to specific disruptions such as cutoff of imports or of electricity.

The third and most important component in studying the systems will be interviews and consultations with people in the areas concerned. This will include management, engineers, programmers, technicians and workers. These people will be able to provide detailed information and insights into system vulnerabilities, and in some cases to provide written documentation. The interviews will be closely structured to obtain information about vulnerabilities to specific disruptions, about back-up or alternative systems, and about obstacles to introducing more resilient systems.

To arrange the interviews, initially letters will be sent to individuals in the sectors asking for relevant written materials and requesting interviews. Any materials obtained will be studied along with those obtained through direct searches, and this information used in drawing up interview schedules. Most of the interviews will be solicited directly by phone or personal contact.

Some standard political and economic explanations for technological development will be used to assess the specific reasons offered as to why greater resilience has not been developed. These explanations include the search for profits, concern for cheapness and reliability of service in 'peacetime', economies of scale, monopolistic practices and maintaining management control over the workforce. An example is the lack of any economic incentive for 'hardening' of civilian electronics systems against the electromagnetic pulse.

The third and final stage of the project will be to place the issue of vulnerability and resilience in the context of different defence modes proposed for Australia. These modes include the present stance of a strong Australian military with the capability for major offensive operation plus alliance with the United States military, and alternatives of non-alignment, armed neutrality, defensive military defence (non-offensive military capability only), guerrilla warfare and social defence (nonviolent resistance only). The literature on these modes does not say a lot about self-reliance, but it should be possible to evaluate whether they imply significantly different policies in relation to the three sectors studied. This stage of the project will be pursued by reading the relevant portions of the literature on these modes and corresponding with their key proponents, evaluating the importance of self-reliance to their success and, most importantly, determining whether a move to these modes would help remove the barriers to self-reliance found in the detailed study.

The scope of the project is broad in addressing the issues of the vulnerability of important technological systems and the relation of these vulnerabilities to different defence modes. But to confront these issues, a narrow focus is made on quite specific vulnerabilities in specific sectors. The limitations of the project include the inherent difficulties in specifying the impact of major military threats on technological systems, the limited focus on vulnerabilities in specific sectors within

Please continue on pages the same size as this form, numbered consecutively, starting with page 7.

Australia, and the limited degree to which different defence modes have been spelled out for Australia.

Timetable

Months 1-6

examination of military threats to Australian, including consultation with experts;

preliminary study of specific sectors in computers, steel and electricity;

sending of letters to individuals in specific sectors;

follow-up of individuals by telephone and personal contact where appropriate.

Months 7-12

study of detailed material about specific sectors;

formulation of interview schedules;

initial interviews with people in specific sectors;

further search for detailed material about specific sectors.

Months 13-18

further interviews with people in specific sectors;

further study of detailed material about specific sectors;

collating and assessment of information about specific vulnerabilities and ways of overcoming them;

evaluation of obstacles to overcoming of vulnerabilities;

assessment of implications of defence modes for self-reliance.

Months 19-24

remaining interviews, study and evaluation of vulnerabilities and self-reliance;

writing up of results.

Justification of budget

The funding of a full-time Research Associate for two years is essential to enable collection of relevant information, arranging and participating in interviews, study of detailed documentation on vulnerabilities and assessment of the information obtained. An appointment at the level of Research Associate is necessary to obtain a person with sufficient technical expertise, research ability and initiative to carry out the literature searches, technical reading and interviewing required. The interdisciplinary nature of the area plus the lack of previous work in the area means that a person with both a breadth of understanding of the social and economic aspects of vulnerability, plus an ability of grasp detailed technical issues, is required.

Travel by both the principal investigator and the Research Associate to Canberra and Sydney is necessary to obtain documentation and especially to carry out interviews. The sectors to be studied in the project were chosen to minimise travel requirements: most of the work can be done in Wollongong or Sydney. The travel budget covers one trip to Canberra (bus) and three trips to Sydney (train) for the Principal Investigator and the Research Associate, of three days each at a per diem allowance of $80.70.

Finally, the obtaining of the relevant documentation on the technological systems will entail expenses for computer searches, photocopying and purchasing reports.

PUBLICATIONS, 1981-

My previous position at the Australian National University did not allow the carrying out of an integrated study of the sort proposed here, and hence the publications listed are not as central to the project as they might otherwise be. My present position, taken up in 1986, provides very positive support for the project, including colleagues who are experts in each of the specific sectors to be studied. Nevertheless, work done previously does bear on many aspects of the project: the publications on electricity grid modelling and on nuclear power involved detailed analysis of complex technological systems; the paper on bureaucracy and the booklet Capital Defence are products of work involving the interviewing of experts on issues related to social and technological systems; a number of papers result from studies of the physical and social consequences of war, especially nuclear war; and the papers dealing with social defence, as well as some work on environmental issues, have covered a number of important questions in the area of self-reliance.

(i) Publications in fields related to the project

Brian Martin. **Uprooting War** (London: Freedom Press, 1984), xi+298 pages.

Brian Martin. The global health effects of nuclear war. **Current Affairs Bulletin**, vol 59, no 7, pp. 14-26 (December 1982).

Jacki Quilty, Lynne Dickins, Phil Anderson and Brian Martin. **Capital Defence: Social Defence for Canberra** (Canberra: Canberra Peacemakers, 1986), 68 pages.

Brian Martin. Nuclear power and the Western Australian electricity grid. **Search**, vol 13, no 5-6, pp. 132-136 (June/July 1982).

Brian Martin. Questioning technology and jobs. In: John T. O. Kirk (ed), **When Machines Replace People** (Canberra: Society for Social Responsibility in Science (A.C.T.), 1981), pp. 117-128.

Ray Kent, Brian Martin, Val Plumwood, Ann Thomson, Rosemary Walters and Ian Watson. Bureaucracy. In: **1984 and Social Control** (Sydney, 1985), pp. 25-33.

Brian Martin. How the peace movement should be preparing for nuclear war. **Bulletin of Peace Proposals**, vol 13, no 2, pp. 149-159 (1982).

Brian Martin. Critique of nuclear extinction. **Journal of Peace Research**, vol 19, no 4, pp. 287-300 (1982).

Brian Martin. Social defence for Australia? In: Jim Falk (ed), **Preventing Nuclear War: Australia's Role** (Wollongong: University of Wollongong, 1982), pp. 56-60.

Brian Martin. Science and war. In: Arthur Birch (editor), **Science Research in Australia** (Canberra: Centre for Continuing Education, Australian National University, 1983), pp. 101-108.

Brian Martin. Social defence and the Indonesian military threat. **Peace Studies**, no 4, pp. 5-8 (July 1984).

(ii) In other fields

Brian Martin, C. M. Ann Baker, Clyde Manwell and Cedric Pugh (editors). **Intellectual Suppression: Australian Case Histories, Analysis and Responses** (Sydney: Angus & Robertson, 1986).

Brian Martin. The scientific straightjacket: the power structure of science and the suppression of environmental scholarship. **Ecologist**, vol 11, no 1, pp. 33-43 (January/February 1981).

Brian Martin. The naked experts. **Ecologist**, vol 12, no 4, pp. 149-157 (July/August 1982).

Brian Martin. Suppression of dissident experts: ideological struggle in Australia. **Crime and Social Justice**, no 19, pp. 91-99 (Summer 1983).

Brian Martin. The selective usefulness of science. **Queen's Quarterly**, vol 90, no 2, pp. 489-496 (Summer 1983).

Jill Bowling and Brian Martin. Science: a masculine disorder? **Science and Public Policy**, vol 12, no 6, pp. 308-316 (December 1985).

Gabriele Bammer, Ken Green and Brian Martin. Who gets kicks out of science policy? **Search** (to appear).

M. Diesendorf, B. Martin and J. Carlin. The economic value of wind power in electricity grids. Proceedings of the International Colloquium on Wind Energy, BHRA Fluid Engineering, Cranfield, Bedford, England, pp. 127-132 (August 1981).

B. Martin and M. Diesendorf. Optimal thermal mix in electricity grids containing wind power. **Electrical Power and Energy Systems**, vol 4, no 3, pp. 155-161 (July 1982).

Brian Martin and Mark Diesendorf. The economics of large-scale wind power in the UK: a model of an optimally mixed CEGB electricity grid. **Energy Policy** vol 11, no 3, pp. 259-266 (September 1983).

Brian Martin and John Carlin. Wind-load correlation and estimates of the capacity credit of wind power: an empirical investigation. **Wind Engineering** vol 7, no 2, pp. 79-84 (1983).

Mark Diesendorf and Brian Martin. Optimal generation planning for electricity grids containing wind farms. Proceedings of the Solar World Congress, Perth 1983, vol 4, Pergamon Press, pp. 2323-2329 (1984).

Brian Martin and D. T. Wickramasinghe. Magneto-optical effects in magnetic white dwarfs - I. The line spectra. **Monthly Notices of the Royal Astronomical Society**, vol 196, pp. 23-31 (1981).

Brian Martin and D. T. Wickramasinghe. Magneto-optical effects in magnetic white dwarfs - II. The continuum. **Monthly Notices of the Royal Astronomical Society**, vol 200, pp. 993-1005 (1982).

Brian Martin and D. T. Wickramasinghe. Magnetic field distributions in white dwarfs. **Monthly Notices of the Royal Astronomical Society**, vol 206, pp. 407-422 (1984).

Brian Martin and D. T. Wickramasinghe. Polarization angle in magnetic white dwarfs. **Astrophysical Journal**, vol 283, pp. 782-786 (15 August 1984).

D. T. Wickramasinghe and Brian Martin. The magnetic field of AM Herculis. **Monthly Notices of the Royal Astronomical Society**, vol 212, pp. 353-358 (1985).

Brian Martin and D. T. Wickramasinghe. A test of the dipole model for the rotating magnetic white dwarf Feige 7. **Astrophysical Journal** (to appear).

Brian Martin. A mathematical modelling course for advanced students. **Newsletter on Teaching Mathematical Modelling**, vol 2, no 2, pp. 4-5 (December 1981).

Brian Martin. Disruption and due process: the dismissal of Dr Spautz from the University of Newcastle. **Vestes**, vol 26, no 1, pp. 3-9 (1983).

Brian Martin. Academics and social action. **Higher Education Review**, vol 16, no 2, pp. 17-33 (Spring 1984).

Brian Martin. Plagiarism and responsibility. **Journal of Tertiary Educational Administration**, vol 6, no 2, pp. 183-190 (October 1984).

Brian Martin. The Australian anti-uranium movement. **Alternatives** (Peterborough, Canada), vol 10, no 4, pp. 26-35 (Summer 1982).

Brian Martin. Proliferation at home. **Search**, vol 15, no 5-6, pp. 170-171 (June/July 1984).

Brian Martin. Environmentalism and electoralism. **Ecologist**, vol 14, no 3, pp. 110-118 (1984).

Jill Bowling, Brian Martin, Val Plumwood and Ian Watson. Strategy Against Nuclear Power. **Social Alternatives**, vol 5, no 2, pp. 9-16 (April 1986).

Brian Martin. Self-managing environmentalism. **Alternatives** (Peterborough, Canada) (to appear).

Brian Martin. Grassroots action for peace. **Social Alternatives**, vol 3, no 1, pp. 77-82 (October 1982). A version has appeared in Japanese: **Crisis**, no 15, pp. 73-81 (1983), and also in Swedish, in: Jan Øberg (ed), **Forsvar for en Karnvapenfri Varld (Defending a Nuclear-free World)** (Stockholm: Wahlstrom & Widstrand, 1983), pp. 211-222.

Brian Martin. Extinction politics. **SANA Update**, no 16, pp. 5-6 (May 1984); Extinction politics revisited. **SANA Update**, no 21, pp. 15-16 (October 1984).

Brian Martin. Science, war and peace (I): building a lasting activism. **Peace Studies**, no 7, pp. 9-12 (October 1984).

Brian Martin. The social construction of Australian peace movement demands. In: Paul Patton and Ross Poole (eds), **War/Masculinity** (Sydney: Intervention Publications, 1985), pp. 87-99.

Brian Martin. Peace research: centre and periphery. **Peace Studies**, pp. 26-27, 49 (November/December 1985).

AUSTRALIAN RESEARCH GRANTS SCHEME
APPLICATION FOR RENEWAL SUPPORT IN 1988

R

APPLICANTS MUST CONSULT THE DOCUMENT "ADVICE AND INSTRUCTIONS TO APPLICANTS "BEFORE COMPLETING THIS FORM

Office use only	File No.
P. P.	

1. INSTITUTION TO ADMINISTER PROJECT
University of Wollongong

2. PROJECT TITLE *(As shown on your last offer of grant) CAPITAL LETTERS*
The vulnerability of some key Australian technological systems to military threats

3. TOTAL FUNDS FOR 1987 REQUESTED IN THIS APPLICATION *(Whole dollars only; final figure in right-hand end square)* $ 11500 GROUP A2 CATEGORY 733 *(See Instructions for codes)*

Is this an interdisciplinary Project? *(See Advice for details)*

Material Science	Education	Computing	Environmental Studies
YES ☐ NO ☒	YES ☐ NO ☒	YES ☐ NO ☒	YES ☐ NO ☒

APPLICANTS Chief Investigators *(see Instructions)*	1	2	3
4. Title, Initials and Surname *(Show Prof/Assoc Prof/Dr/etc)*	Dr B Martin		
5. Full address	Department of Science and Technology Studies University of Wollongong POBox 1144, Wollongong NSW 2500 Telephone: (042)270763 Telex: 29022	Telephone: Telex:	Telephone: Telex:
6. Appointment held	Lecturer		
7. Department/school/other *(Please indicate which)*	Department of Science and Technology Studies		
8. Year of birth	1947		
9. Gender	☒M ☐F	☐M ☐F	☐M ☐F
10. Academic qualifications. Indicate conferring institutions and dates.	BA, Rice University, 1969 PhD, Sydney University, 1976		
11. Average days per month to be devoted to the project.	6		

12. Indicate whether you are also applying for 1988 support from:

	MST Grants Scheme	NH & MRC	NERDDC	Other
If "YES" state project title and amount requested on page 3.	YES ☐ NO ☒	YES ☐ NO ☒	YES ☐ NO ☒	YES ☒ NO ☐

13. CLEARANCE REQUIREMENTS (It is essential that this Section is accurately completed)

Please tick appropriate box

			Yes	No
(a)	(i)	Does this project involve experimentation on humans or animals?	☐	☒
	(ii)	If YES, is a **signed completed** Ethics Committee approval submitted with this application?	☐	☐
(b)	(i)	Does this project involve the *in vitro* production of recombinant DNA molecules?	☐	☒
	(ii)	If YES, is a **signed** statement of approval by your Institutional Biosafety Committee (or equivalent) submitted with this application?	☐	☐
(c)	(i)	Does this project involve ionising radiation?	☐	☒
	(ii)	If YES - do you have appropriately trained personnel?	☐	☐
		do you hold a current licence?	☐	☐

NOTE: copies of clearances, where required, for Questions 13 a, b, and c must be forwarded to the Secretary of the Committee no later than 1 June, if not available at the time of submission of this application. Failure of the applicant to ensure that these requirements are met will affect consideration of the application.

14. Has the proposed duration of this project changed? YES ☐ NO ☒

15. (a) Indicate any anticipated period of absence from Institution during the course of the project.			
(b) Indicate any anticipated period of absence on Outside Studies Program.			
16. What other major research programmes are being undertaken or closely supervised by the Chief Investigators?	Comparative study of the social and institutional entrenchment of different technologies		

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OTHER PROJECT INFORMATION

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This project	A58616208 Vulnerability of technological systems						I
Other ARGS projects							

18. Except for any special items needed, are the necessary basic services and equipment, such as an equipped laboratory, staff workshop, secretarial assistance and a departmental maintenance or research vote available for general support of the project? YES☒ NO☐

If "NO", please elaborate.

OTHER PARTICIPANTS

19. Provide details of Associate Investigators *(see Instructions)*. List names, qualifications, dates conferred and conferring institutions Indicate involvement in the project in average days/month. Certification required below

20. What technical and other staff (other than those requested) will be available to assist with the project? Indicate involvement in the project in average days/mth.

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I/WE understand and agree that,

(a) research which involves human or animal experimentation must be carried out in accordance with the guidelines laid down in the NH & MRC code of practice,

(b) research which involves th use of recombinant nucleic acids constructed *in vitro* from sources which do not ordinarily recombine genetic information must be carried out in accordance with the guidelines laid down by the Recombinant DNA Monitoring Committee,

(c) research which involves the use of ionising radiation must have the risks involved assessed by a recognised Ethics, Safety or Bio-safety Committee, personnel must be trained and hold a current licence, and;

(d) ☐ EITHER a certificate of compliance with the appropriate guidelines must be received by the committee from a recognised Ethics, Safety or Bio-safety Committee before payment of any proposed grant can be made.

☐ Or the certificate of compliance with the appropriate guidelines which was submitted to the ARGS for this project in 19 ..... remains valid.

(e) I/We declare that all persons listed as Associate Investigators have agreed to take part in the proposed research.

..... Date: ..../..../....

Chief Investigator(s)

(B) TO BE SIGNED FOR ALL APPLICATIONS

Signature(s) of Chief Investigator(s) (1) Brian Martin Date: 13/3/87

(2) ..../...../.....

(3) ..../...../.....

Certificate of Head of Department *(See Instructions on Item 17)*

(Heads of Department are requested to either sign the certificate below or to forward a confidential statement.)

I certify that the project is appropriate to the general facilities in my Department, that sufficient working and office space is available for any proposed additional staff and that I am prepared to have the project carried out in my Department.

Signature..... Date.13/3/87.

Head of Institution (or Nominee)

I certify that the project is acceptable to the institution and the salaries quoted for personnel are in accordance with the practices at this institution.

Signature..... Date...../...../.....

Designation.....

(SEE INSTRUCTIONS FOR THE COMPLETION OF BUDGET INFORMATION)

DETAILED BUDGET FOR 1988			OFFICE USE ONLY
Items	Priority	Amount requested ($)	File No.
Personnel Research assistance	A	11,000	
Other Computer searches, purchase of documents and photocopying	B	500	
	TOTAL	11,500	

Will you be available for an interview if required *(See Instructions for dates)* YES ☒ NO ☐ UNCERTAIN ☐

ARGS Financial Support	Personnel $	Equipment $	Maintenance $	Travel $	Total $
1988 support - requested	11,000	500			11,500
Estimated request for 1989					
1988 support - forecast last year	28,266	400			29,380
Granted for 1987	10,000				10,000
Granted for 1988					
Granted for 1986					
Granted for 1985					

KEYWORDS
Give up to five keywords to describe the subject area of proposal

1. self-reliance
2. vulnerability
3. steel
4.
5.

PROJECT CLASSIFICATION
(Repeat as shown on Page 1)

A 2 Group
7 3 3 Category

TOTAL SUPPORT Give details of support during 1986 and 1987 (and requested or to be requested for 1988) separately for (a) this project and (b) other projects (show research field) from your own institution and from all grant giving bodies, including the ARGS.

Complete at least one line of the table, indicating "None" where appropriate.

Details of Project / Name of Body	Amount ($) 1986	1987	1988 (Requested)
(a) Vulnerability of technological systems/ARGS		10,000	11,500
(b) Australian fluoridation programmes/U Wollongong	870		
Fluoridation and herbicide controversies/U W'gong		1,000	
Women in science/U Wollongong (to be submitted)			?

Project title: (Repeat title shown on page 1)
The vulnerability of some key Australian technological systems to military threats

ADMINISTERING INSTITUTION University of Wollongong

Surname 1st Chief Investigator: Martin

AIMS & SIGNIFICANCE

The aim of this project is to examine in detail the vulnerabilities and resilience of key technological systems in Australia in the face of military attacks, including nuclear war in the northern hemisphere, economic blockade, and invasion. Because the amount allocated for 1987 is about one-third that requested, it is planned to focus on one of the three technological systems initially indicated, namely steel manufacturing. In looking at steel, the aim is to answer several questions.

* What are its critical vulnerabilities, both technical and human?
* What are the social and political factors which have inhibited the development of a more resilient industry?
* What are the simplest steps to make the industry more resilient?
* What is the relation of different defence modes to the promotion of a more resilient industry?

As indicated in the initial application, the project was to start as soon as a research assistant was appointed. Applications have closed for the position, and it is anticipated that a candidate will be chosen in April to work half time for about 8 months or full time for 4 months, with an expectation for similar work in 1988.

By the end of 1987, it is anticipated that a set of attack scenarios will be assessed, that a literature search on industrial vulnerabilities be carried out, that a detailed plan for obtaining information about steel industry vulnerabilities and resilience be formulated and that a substantial portion of planned interviews with management and workers at BHP in Wollongong be completed.

This will leave for 1988 the completion of interviewing, development of explanations for vulnerability and resilience, and placing the issue of vulnerability and resilience in the context of different defence modes proposed for Australia.

During holidays in the United States in December and January, the Chief Investigator searched several large libraries for material relating to steel manufacturing vulnerabilities. The paucity of information on this topic, with nothing at all directly on the topic, suggests that this study has the potential to open new ground in the study of technological systems.

The principal budget item for 1988 provides for the continuation of research assistance for the second year, with allowance for 10% inflation. This item is essential for completion of the project.

Continue overleaf