GLOBAL SPENDING ON NUCLEAR DISARMAMENT VERIFICATION WORK

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verificationmatters

VERTIC RESEARCH REPORTS
number 3 april 2002

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Funders Ford Foundation, Joseph Rowntree Charitable Trust, W. Alton Jones Foundation and the Diana, Princess of Wales Memorial Fund.

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Printed in the United Kingdom by Corporate and Commercial Printing (CCP) Limited
5–8 Helmet Row, London EC1V 3QJ
ISSN 1474-8045

Foreword and acknowledgements

I would like to acknowledge helpful comments on the draft of this report which I received from Jürgen Altmann, Maurice Bryson, Leslie Casey, Trevor Findlay, Oliver Meier and Jill Warren. Naturally, responsibility for the content of the report is mine alone.

Although I believe that the picture presented in this report is a fair reflection of the overall situation, it is inevitable that some of the data may be incomplete, inaccurate or unbalanced. I would be glad to receive comments, through VERTIC, from practitioners in the field and interested readers, with a view to a possible revision and updating of the report.

Acronyms

Atomic Weapons Establishment (UK)	**AWE**
Federal Institute for Geosciences Natural Resources (Germany)	**BGR**
Brookhaven National Laboratory	**BNL**
Chemical and Biological Weapons	**CBW**
Commissariat à L'Énergie Atomique	**CEA**
Comprehensive Nuclear Test Ban Treaty (1996)	**CTBT**
Comprehensive Nuclear Test Ban Treaty Organization	**CTBTO**
Cooperative Threat Reduction	**CTR**
Defense Advanced Research Projects Agency (US)	**DARPA**
Department of Defense (US)	**DOD**
Department of Energy (US)	**DOE**
European Atomic Energy Community	**Euratom**
Fiscal Year	**FY**
Highly-Enriched Uranium	**HEU**
International Atomic Energy Agency	**IAEA**
International Data Centre	**IDC**
International Monitoring System (under the CTBT)	**IMS**

Initiatives for Proliferation Prevention	**IPP**
Los Alamos National Laboratory	**LANL**
Low-Enriched Uranium	**LEU**
Lawrence Livermore National Laboratory	**LLNL**
Mixed Oxide	**MOX**
Material Protection, Control and Accounting	**MPC&A**
Member State Support Programme (IAEA)	**MSSP**
National Data Centre	**NDC**
Nuclear Explosion Monitoring Research and Engineering Programme	**NEM**
Non-Governmental Organisation	**NGO**
National Nuclear Security Administration (US)	**NNSA**
Nonproliferation and Arms Control	**NPAC**
Non-Proliferation and Arms Control Technology Working Group	**NPAC TWG**
Nuclear Non-Proliferation Treaty (1968)	**NPT**
National Technical Means	**NTM**
Provisional Technical Secretariat (of the CTBTO)	**PTS**
Russian American Nuclear Security Advisory Council	**RANSAC**
Research and Development	**R&D**
Research, Development, Testing and Evaluation	**RDT&E**
Strategic Arms Reduction Treaty	**START**
Weapons of Mass Destruction	**WMD**

Introduction

It is sometimes argued that advances in the technologies and techniques that are vital for implementing and verifying nuclear arms reductions would facilitate the political decisions necessary to achieve deep cuts in nuclear weapons and, ultimately, the creation of a nuclear weapon-free world.[1] To assess the scope for such advances being made in the near future, it is useful to survey current worldwide patterns of expenditure on verification and related research and development (R&D). The scale, geographical location, organisation and technical objectives of existing work will help suggest where opportunities lie for reform or expansion of efforts worldwide.

Even allowing a broad definition of relevant work—say, 'verification and other aspects of nuclear arms control, nonproliferation and disarmament'—there is ambiguity over whether certain areas of research, or particular government or institutional programmes, should count as verification and arms control expenditure or be considered part of a more general 'national security' budget. Indeed, even in cases where expenditure on monitoring technologies can be tied directly to a requirement to monitor compliance with an arms control treaty, it may be that some countries would want to obtain the same kind of information for national security purposes regardless of the specific treaty context. Clearly, there is no simple means of classifying such R&D, since it has applicability to arms control and to broader national security interests. This caveat does not, however, obscure the scale of the resources spent on scientific and technical work bearing on nuclear arms control and disarmament or the main thrusts of this work.

A cursory look at the field shows that the greater part by far of the global total of such scientific and technical work—probably more than 90 percent—is performed in the US. The work is funded from a variety of sources and spread among a great many establishments, with the largest programmes located at the national nuclear weapon laboratories. The first part of this paper looks at the main components and objectives of US-based work.

Russia, China, France and the UK, the other nuclear weapon states recognised as such by the 1968 Nuclear Non-Proliferation Treaty (NPT), also support at least some relevant work, as do a number of other countries either in connection with civil nuclear power programmes or as part of their involvement in multilateral arms control. This worldwide body of work is described in the second part of this report. Because negotiating and verifying nuclear disarmament is likely to be an international enterprise, more detail is given about some of the non-US-based work than is warranted by the size and objectives of the actual activity.

The overall picture is one of very uneven patterns of expenditure, especially as between the US and the rest of the world. This raises the question how a country might decide on judicious levels of investment in this field—a complex issue briefly discussed in the final section of this study.