

Preface

In the aftermath of the end of the Cold War, it is clear that multilateral arms control, unilateral declarations and actions, and arms control by mutual example will be the predominant approaches in future arms control efforts, most notably with regard to constraining weapons proliferation. In this emerging context, the synergistic effects amongst methods of verification will become increasingly important in assuring cost-effective verification, as budgets and resources come under increasing restraint.

Discussions and research relating to verification have often focused on the evaluation and enhancement of specific verification techniques, procedures or agencies. There has been little written about the synergistic effects amongst various methods of verification — that is, the ways in which the operations and data from several sources can combine to produce a final result that goes beyond what could be achieved by each of the separate inputs alone.

Four distinguished scholars — two American and two Canadian — were invited to come together to explore these synergistic effects and to identify how they could be harmonized to enhance verification effectiveness, particularly in the context of curbs on proliferation. This report provides their comprehensive and ground-breaking overview of this subject.

Readers will note that two general analytical approaches are evident in the report. The first, which constitutes the main thrust of the report, examines the subject from a policy perspective, reviewing synergies as they appear in past arms control agreements, describing a variety of synergistic effects amongst methods of verification, and suggesting how these effects impact on the nature and scope of efforts to control proliferation. The second approach, represented by Appendices A and B, addresses the subject

from a different perspective, using a high level of abstraction. Deriving a formal model of some aspects of verification synergies, a mathematical analysis is conducted in Appendix A to demonstrate several underlying dynamics of the topic.

This report follows an earlier one representing the results of a study by a combined team of American and Canadian scholars.* Like the former, it constitutes an important example of co-operative research in this important area of verification. It is being made available to researchers and specialists in the field in fulfilment of one of the objectives of Canada's Verification Research Program, which is to contribute to improved understanding of questions relating to verification in all its aspects.

* Sidney Graybeal, George Lindsey, James Macintosh and Patricia McFate, *Verification to the Year 2000*, Arms Control Verification Studies No. 4, Ottawa: External Affairs and International Trade Canada, 1991).