

Programmgruppe Technologiefolgenforschung

**The Verification of International
Conventions on Protection of the
Environment and Common Resources**

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**A Comparative Analysis of the Instruments
and Procedures for
International Verification with the Example of
Thirteen Conventions**

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Abstract

Verification of compliance is a sensitive issue in arms control. However, these treaties make up only a very small portion of international agreements. Besides the regulation of manifold political, technical, economic and other problems more and more transnational environmental and resources protection problems are the subjects of multilateral treaties ("ecological interdependence"). The question is raised whether these treaties contain verification provisions which can be compared with arms control verification: Therefore thirteen multilateral conventions and protocols for the protection of the environment and common resources are investigated with respect to their verification provisions.

The results of the contents analysis are the following:

Rules on the compliance examination by the conventions member states are laid down in the conventions examined. However, they are generally imprecise and not wide ranging. The member states are indeed obliged to make declarations, i.e. they must draw up something like implementation reports containing information about internal realization of the convention and pass them on to an international body specified in the convention.

Nevertheless, what happens to these national declarations in the international body is by no means clear. The provisions in the conventions with respect to the examination of these declarations (verification process) are usually formulated in a very general manner: verification of national implementation reports is only explicitly envisaged in six conventions. Such an examination within the international body envisaged for this purpose may be termed "verification by report monitoring" or by "audit". All other conventions only mention an examination of the implementation of the convention which is not further defined. The practical form this examination should take cannot be derived from the conventions' content. Since in all conventions examined the countries are obliged to provide information or data about implementation, in practice a type of audit is conceivable too.

Such a rudimentary verification system of audit differs in many respects from the verification of important multilateral and bilateral arms control conventions. The lack of any national or international inspectors exercising verification activities with their own measuring and surveillance instruments in the countries themselves is one central difference to modern arms control treaties among others.

Several explanations can be put forward for such weak verification provisions in environmental and resource protection conventions. One goes that international environmental policy either does not objectively affect any political field relevant to (inter)national security and power politics or else is not perceived as a security policy. Therefore there is at best little (but not necessarily no) need for verification.

Nevertheless, there are some strong arguments pointing to a gradual development in the interlinkage of security and the environment. Above all the discussion on a convention to reduce anthropogenic greenhouse gas emissions up to 60 percent seems to be moving in this direction: The economic burden on the countries by the measures for reducing the GHG emissions, which lead to the free rider position becoming quite attractive, will probably take on such dimensions that repercussions on the countries' power positions are not to be dismissed out of hand. If a GHG convention thus falls within the scope of "high politics" then a demand for international verification far beyond that of present environmental protection conventions will probably result.

Table of Contents

Introduction	1
The Theoretical Framework	1
The Verification Problem	4
Comparative Analysis	8
Assessment and Conclusions	22
Literature	36

Introduction

International conventions on environmental protection are receiving increasing interest from scientific disciplines concerned with transboundary problems and the political sciences are no exception. However, as yet the political discipline of "international relations" has paid little attention to the question of whether the verification of the provisions of environmental protection conventions is (or should be) subject to international verification (compliance examination). This contrasts sharply with the immense work researchers have dedicated to problems of arms control verification (cf. Cheon/Fraser 1988). The present paper intends to make a contribution towards bridging this gap.

The Theoretical Framework and the Issue Area

Anthropogenic activities have always changed the natural systems, involving many and varied repercussions on the human environment, habitat, means of production and way of life.

Attempts at controlling interactions between man and the environment and of avoiding negative feedback are as old as human civilization itself. And yet, a qualitatively new situation is emerging today: "(...) The problem (of managing interactions between man and the environment, W. F.) has been transformed today by unprecedented increases in the rate, scale and complexity of those interactions. What were once local incidents of pollution now involve several nations (...). What were once acute episodes of relatively reversible damage now affect multiple generations (...). What were once straightforward confrontations between ecological preservation and economic growth now involve multiple linkages (...). We have entered an era characterized by syndromes of global change that stem from the interdependence between human development and the environment." (Clark 1989: 19-20). The problem dimension is characterized by the catchwords acid rain, tropospheric ozone accumulation and stratospheric ozone depletion, greenhouse effect, overfishing

of the seas, forest destruction, endangered species, risks to the soil and pollution of ground and surface water.¹ Not only the increasing intensity of anthropogenic impacts on the earth is of significance but also their spatial extent: transnational, indeed global environmental pollution and its impacts are characteristic of the interactive relationship between natural and human systems in the closing years of the twentieth century. (For the climate system cf. IPCC 1990). In contrast to this global ecological problem dimension, the structure of the international system still remains divided into nation states. In spite of efforts at regional integration and the emergence of transnational and international (governmental and non-governmental) actors, also in environmental protection (Rayner 1991), the dominant role of the nation states continues to characterize structures and processes in international politics. Neither perceptionally nor practically is there one "humanity" or one "world domestic policy" nor does the concept of a "world society" have linguistic clarity or analytical substance. Even in the environmental sector countries do not take action from a sense of global responsibility but rather according to the extent to which they are affected nationally,² and their own aims are not always compatible with the superordinate perspective of an international management of transboundary, indeed global problems. At the same time widespread transboundary ecological impacts and the more intensive exploitation of resources have contributed towards undermining "national sovereignty" which is basic to territorial states. An increasing ecological interdependence has now joined the multifarious interrelationships of countries in the military, economic, social and communications sector. These developments have led to tensions between national policy and international interdepen-

¹ Cf. the contributions in Scientific American, September 1989; international data series on environmental pollution can be found in: World Resources 1990-91: A Guide to the Global Environment. World Resources Institute, New York/Oxford 1990 (Oxford University Press).

² "The degree to which countries have taken steps to reduce their pollution can thus be seen in large measure as a function of the array of factors affecting their self-interests." (Fraenkel 1989:463).

dence and increase the need for international regulation of these multifaceted problem areas. Political science attempts to analyze these tensions and the consequences by the interdependence theory (Keohane/Nye 1987) and to accommodate approaches to international problem solving by the regime theory (Krasner 1983).

The results of political research indicate that international cooperation in the solution of problems of transnational interdependence does not automatically result from an objective problem structure. A gap opens up between the identification or analysis of a problem and its solution which has to be overcome by political action. However, political action is not a voluntaristic act of volition but itself emanates from complex structural and process-specific boundary conditions, which are largely subject-independent. As a rule, difficulties in establishing international cooperation do not primarily arise from an unwillingness on the part of the political actors or the impossibility of arranging cooperative action. As the game theory shows, the autonomous (national) actors may achieve a consensus about their behaviour to the satisfaction of all parties in various interdependent situations (Siebe 1991). Neither is the problem rooted in a lack of attractiveness concerning the benefits to be obtained by cooperation, "but rather in the (...) dilemma that parallel interests represent a necessary but not sufficient basis for achieving collective action (...). Additional incentives and conditions are required in order to achieve the integration of autonomous actors into an institutionalized cooperation context,

- as long as there is uncertainty concerning the readiness of the other actors to undertake obligations,
- as long as the distribution of costs and benefits arising from cooperation is itself still contested, and
- as long as the role of a free rider remains extremely attractive." (Kohler-Koch 1989:22-23; translation W.F.).

Political science is attempting to identify both concretely and precisely the conditions under which obstacles to cooperation

can be overcome and durable cooperation ensured. This discussion will not be pursued here (cf. Wolf/Zürn 1989). As a result of this research it seems that one of the necessary conditions for the establishment and preservation of cooperative behaviour consists of "making available relevant and actor-specific information creating the (...) necessary transparency to obtain a well-founded and mutually verifiable estimate of the reliability of behaviour in conformity with the regime" (Köhler-Koch 1989:23; translation W.F.). In general it may be said that the chances for international cooperation in general and the formation of international regimes in particular are improved (among others) if verification instruments are available (Young 1989). So the hypothesis is that verification can make a substantial contribution towards establishing and preserving international cooperation. It therefore could be an essential instrument for creating and guaranteeing international cooperation.

The Verification Problem and Verification Sectors

Verification is defined as *a contractually agreed process for determining contractual compliance by the contracting states. Verification may make use of predetermined technical instruments (measuring systems, surveillance instruments) and also other methods (inspections, reports and auditing). Compliance is established ex post facto and prevention of infringements is not the aim but rather the detection of infringements.*

The goal of verification is to establish reciprocal certainty for the contracting states that contractual compliance is maintained in those political fields for the regulation of which international treaties have been concluded. Verification has therefore three functions (cf. Richter/Fischer/Stein 1989):

- a *detection* function with the aim of a timely warning of any (substantial) infringement of treaty obligations;
- based on that a *deterrence* function intended to discourage states from infringing the treaty;
- a *confidence building* function intended to have a positive effect in the international relations in general.

Verification may be implemented on a country to country (bi- or multilateral) basis or by an international organization. In the

first case countries undertake reciprocal verification whereas in the final case verification is implemented by the representatives of an international organization. Verification must *not* be confused with internal *implementation* of the contractual obligations which remains the exclusive responsibility of each contracting party. Verification is intended to establish confidence that this internal implementation has effectively been realized by each contracting party.

In the verification process, the countries make available the information necessary for assessing their compliance. These declarations are examined by other states or an international organization with respect to their reliability and credibility.

An examination of the literature on verification reveals that verification activities seem to concentrate on arms control and has been primarily agreed on a bilateral basis between the USA and the USSR. Nevertheless, especially in the course of the Geneva negotiations for the prohibition of chemical weapons multilateral verification is gaining significance. Today the Non-Proliferation Treaty (NPT), which has 140 member states, is so far unique: It is the only treaty where compliance is verified (in the non-nuclear weapons states) by an international organization, the International Atomic Energy Agency (cf. IAEA 1985). In the chemical weapons convention an international verification organization, the second world wide one, is envisaged (Krause 1991).

However, such treaties only represent a small proportion of international conventions just as environmental and resource protection treaties - but their number is comparatively higher. For a number of years international conventions on the protection of the environment and resources have been taking on increasing significance due to their extension to new regulatory fields, their increasing number and the density of their provi-

sions.³ In view of the structures and processes of international politics, the question arises of whether compliance with these conventions should also be verified as in the case of arms control.

There are certain arguments in favour of a special status for arms control as a field for verification:⁴

- Arms control concerns a central and sensitive political issue area with a high damage potential, namely national security. Most other international agreements concern areas of comparatively slight relevance.
- Compliance examination in the isolated field of security and armaments policy is not possible in a wide range of conventions without specific, in part intrusive verification measures. In the case of the vast majority of international conventions, verification of compliance is probably not so problematic or indeed apparent.
- The potential gain in power by even a slight bypassing of contractual provisions may be potentially high in the international security sector (or at least perceived by the national actors to be high).
- Many international conventions are agreed between countries who have long, intensive and diversified interrelationships. The basis of their joint interests is solid and there is little mutual mistrust or indeed none at all. Arms control agreements, in contrast, must be concluded

³ The concept of environmental protection convention as used in this text includes the more comprehensive sense of resource protection.

⁴ But verification agreements have not been made for all arms control conventions. In some cases, "national technical means" (NTM), i.e. the contracting countries' own monitoring instruments, are used to verify compliance. (Cf. Lewis 1991). Although there are agreements on verification for other treaties, generally on local inspections (Antarctic, space, moon and seabed treaty) they are however not put into practice.

with political and military adversaries. The need for verification correlates positively with the degree of mistrust (Efinger/Breitmeier 1991).

Arguments can, however, be put forward which point to an altered function of international environmental protection conventions for national interests and international politics:

- The concept of security has become more comprehensive. After the oil crisis of 1973 the military dimension of security was supplemented by an economic aspect (Deese/Nye (Eds) 1981). Attempts may be observed at present towards extending the security concept to include an ecological dimension, a change of paradigm in strategic studies is required to accommodate this new problem dimension (cf. Holst 1989; Westing 1989; Fulkerson et al. 1989; Brown 1989; Brundtland et al. 1987; Myers 1987).
- The international regulation density in environmental policy is increasing with the number of conventions,⁵ the relevance of regulations is higher and restricts national activity in favour of internationally agreed norms of action (for Germany cf. Hohmann 1989).
- The most recent conventions on environmental protection (Vienna Convention, Montreal Protocol) and in particular an envisaged convention for the drastic reduction of greenhouse gas emissions interfere with the (central) economic interests of a country and may also influence its economic and by that its world wide power position. In view of this, the countries would be at pains to ensure that all contracting parties really bear these burdens and do not take on a free-rider position whereby they profit

⁵ The development in the number of multilateral conventions (and protocols) on environmental protection: Before 1900: 2; 1900-1930: 5; 1930-1940: 3; 1940-1950=31; 1950-1960=61; 1960-1965=44; 1965-1970=32; 1970-1975=51; 1975-1980=48; 1980-1985=52 (figures from Burhenne 1974 ff); cf. for the USA: Hahn/Richards 1989.

from the measures implemented by other countries at no expense to themselves.

It can therefore be argued that over and above the security sector verification will also play, or indeed already plays, an important role in environmental protection conventions. In this connection, the decision by the Study Commission of the 11th German Bundestag "Preventive Measures to Protect the Earth's Atmosphere" is interesting of having a paper prepared on the verification of a greenhouse gas (GHG) convention (cf. Fischer/di Primio/Stein 1990). The conclusion may be drawn that sectors of the scientific and political community see at least a need for analysis.

But what is the actual position today with respect to the verification of international environmental protection conventions?

In order to provide an initial answer to this question a comparative contents analysis of selected conventions will be presented in the next section indicating whether and - if so - which provisions or verification can be found in international environmental protection conventions.

Comparative Analysis of Verification Provisions

Arguments may be derived from political theory to justify a political need for the verification of international environmental protection conventions. But what is the position in political practice as expressed in the conventions? Are verification measures only to be expected for *future* conventions, or are they laid down in conventions *already* in force? Even the observation that verification is not touched upon in present conventions on international environmental protection would be an important insight in view of theoretical considerations on the structures and processes of international politics; for verification was mentioned in the theoretical section of this

paper as one of the conditions for establishing and maintaining international cooperation.

One *hypothesis* to be scrutinized is therefore: *a form of compliance verification is also to be expected for environmental conventions already concluded.* Admittedly, other factors could have a great influence on verification regulations: in particular the subject of the treaty may be of great significance. A second *hypothesis* is therefore that *verification regulations are proportional to the relevance of the subject matter.* In the course of time, an intensification of verification regulations should be found in the conventions, i.e. more recent conventions are verified more precisely than older treaties (higher verification density).⁶

In order to ensure economy of labour, this investigation is restricted to multilateral treaties on environmental protection without considering bilateral agreements. Even so approx. 350 environmental agreements had been concluded by the end-eighties⁷ and this study must therefore concentrate on a limited selection.

Eleven multilateral conventions and two protocols were selected:⁸

- International Convention for the Regulation of Whaling

⁶ The concept of intensification (higher intrusiveness of verification) cannot be quantified here but must be covered qualitatively, cf. Fischer/di Primio/Stein 1990).

⁷ Cf. Burhenne 1974. With the exception of the Vienna Convention and the Montreal Protocol the texts of the following conventions can be found there.

⁸ The conventions are given in the sequence corresponding to the issue area they belong to (common resources protection; marine environment, atmosphere/stratosphere and water protection). In the text, the conventions are identified by the abbreviation used in the figure. The Long-Range Transboundary Air Pollution- and the Vienna Convention are only framework conventions. Therefore its two protocols were explicitly examined. In some other cases amending protocols to conventions were also evaluated. This is indicated in the figure. Since - in contrast to the two former protocols - they do not regulate independent subject areas they are included in the respective convention in the figure.

- Convention on International Trade in Endangered Species of Wild Fauna and Flora ("Washington Convention")
- Convention for the Conservation of Salmon in the North Atlantic Ocean
- Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
- Convention for the Protection of the Mediterranean Sea Against Pollution
- Convention for the Prevention of Marine Pollution from Land-Based Sources
- Convention on the Protection of the Marine Environment of the Baltic Sea Area
- Convention on Long-Range Transboundary Air Pollution
- Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on the Reduction of Sulphur Emissions or Their Transboundary Fluxes by at Least 30 per Cent⁹ (known as the "30 % Club")
- Convention for the Protection of the Ozone Layer (known as the "Vienna Convention")
- Protocol on Substances that Deplete the Ozone Layer (known as the "Montreal Protocol")
- Convention for the Protection of the Rhine Against Chemical Pollution.

Such a selection always contains arbitrary elements, but it was not made on a random basis. The following reasons were decisive:

- The conventions or protocols cover a long period of time (1948-89) and should therefore be appropriate for indicating an evolution in verification provisions.

⁹ The Sofia Protocol on the reduction of NO_x emissions has not been examined because it came into force in spring 1991. At that time the study was finished.

- The number of member states and their political and economic structure is very varied since both regional and also worldwide conventions are involved. This might influence the verification provisions.
- The conventions cover a fairly broad range of regulation areas. The contents of the regulation areas may be of significance for the nature of the verification measures.

The conventions¹⁰ were analyzed in two steps. They are first examined with respect to regulations for internal implementation and with respect to nations' obligations to acquire and transmit information to other contracting states or an international organization. Emphasis is therefore placed on **declaration** obligations on the part of the individual countries. Declarations are representing the basis for verification. In a second step, the conventions are examined with respect to the **verification** provisions. Key words are: the organizational structure of verification activities; the verification procedures; cooperation agreements which may be of relevance for verification; regulation of technology transfer.¹¹

Both the creation of the categories intended to cover the verification system and also the allocation of convention provisions to these categories (see **Figure**) was not always easy or clear cut. This allocation must therefore occasionally be explained or specified in the text.

As a further qualification, it must be added that this paper does not make any statements on the adequacy or weakness of the material regulations nor the realization of the conventions'

¹⁰ In the following text the protocols are as a rule subsumed under the concept of conventions.

¹¹ This has two aspects: The common development or transfer of verification technology; second, restrictions on or encouragement of technology transfer is investigated since many international agreements cannot include all relevant countries (universality problem). Both positive and negative incentives to accede to a treaty can be provided by rules for technology transfer.

content. This would require extensive ecological, implementation and impact analysis. (Cf. for some marine conventions cf. Feldman 1991). Nor is any consideration given to the central question of the application of negative incentives (sanctions) in the case of infringements of the provisions.

The results of the contents analysis (see **Figure**):

In 7 of the 13 conventions studied, national authorities are mentioned in the text of the agreement charged with the task of implementing the convention without these authorities being explicitly designated. As a rule, implementation (and internal control of its success) will be the task of an existing national authority. As far as I am aware, new national authorities are not created by these conventions. In the Whaling Convention a national authority is not mentioned although the employment of inspectors envisaged in the agreement points to his organizational incorporation of existing national agencies. In the Vienna Convention and the Convention on Long-Range Air Pollution as well as their protocols (Montreal, 30 % Club) no national implementation authorities are mentioned although the conventions lay down a reduction in emissions for the first time and also include East European countries. This may be explained by the unambiguous nature of the national regulations with respect to the licensing and implementation authorities responsible for air pollution control¹². National implementation systems already exist and there is no need for further domestic action with respect to completely new organizational measures. Furthermore, it must be remembered that the European (Economic) Community (EC) is responsible for the realization of some international agreements within the Community. This is expressed, for example, in EC directive 3322 which describes the procedure for implementing the Montreal Protocol within the

¹² Germany has special "Genehmigungsbehörden", which is very difficult to translate simply because there is no such (single) authority in the anglo-american administrative system. A translation could be 'authorities responsible for granting planning approval'.

Community.¹³ It would therefore not be opportune to mention national authorities in such a convention.

Almost all agreements oblige the member states to procure data and information providing evidence of the implementation of and compliance with the treaty. These obligations are generally only laid down in a very general form. Measurements to determine pollutant fluxes, dumping etc. are only explicitly envisaged in the conventions on long-range air pollution, its SO₂ protocol, the Vienna Convention and the Convention for the Protection of the Rhine Against Chemical Pollution. This has resulted in the construction of transboundary measuring networks: apart from the early warning system for pollution of the Rhine, the computer-assisted system for determining emissions and immissions of SO₂ (the European Monitoring and Evaluation Programme - EMEP) with monitoring stations in 24 member countries is of particular significance.¹⁴ In an annex on "Research and Systematic Surveillance" the Vienna Convention for the Protection of the Ozone Layer stipulates that the member states should cooperate in establishing a system for measuring global ozone (Global Ozone Observing System) whose central technical components should be satellites and terrestrial systems.

The conventions therefore include general or special standards regulating national information acquisition which could function as a basis for declarations on compliance. However, there are problems with the standardization and comparability of information. For example, it has not yet been possible to harmonize the calculation methods for SO₂ emissions between the member states of the 30 % Club (Fraenkel 1989: 460f).

¹³ Cf. Directive (EEC) no. 3322/88 of the Council of October 14, 1988 on certain chlorofluorocarbons and halons which lead to depletion of the ozone layer, in: Official Journal of the European Communities No. L 297, 31st year, Oct. 31, 1988.

¹⁴ This Programme was established in 1977 by the Economic Commission for Europe (ECE) in cooperation with the United Nations Environmental Programme (UNEP) and the World Meteorological Organization (WMO), cf. Fraenkel 1989:458ff; Hohmann 1989:35.

Statements on national assessment and licensing obligations can be found in nine conventions. The countries must monitor activities relevant to the convention in their sovereign territory and, based on this, issue authorizations or prohibitions. This mainly involves checks on technical facilities and processes. Thus, for example, ships' tanks and mobile or stationary incinerators may be inspected with respect to compliance with technical standards, or a chemical analysis of substances to be dumped in protected oceans or waters is envisaged in order to prevent dumping of prohibited substances. The convention on endangered species permits inspections by representatives of national authorities (for example the customs investigation department) within the country: they may control in pet shops (or any other place) whether animals are being transported in an appropriate manner, whether the required import and export licences can be presented for imported plants and animals, or whether (in violation of the convention) animals and plants on List 1 are being imported or exported. This convention to monitor *trade* differs from other conventions to the extent that the monitoring activities of national authorities in their own country can provide important information about compliance in other countries. The appearance of protected species from a different member state without a customs permit (or with forged papers) points directly to deficiencies in the implementation of the convention in the partner country. There is no particular mention of assessment and licensing obligations in the Convention on Long-Range Transboundary Air Pollution and its SO₂ protocol. This might be regarded as superfluous in view of the clear national licensing rights. The Vienna Convention for the Protection of the Ozone Layer is a framework convention and only the Montreal protocol is of operative significance for emission reduction. The assessment and licensing obligations which all members have to enforce in their industries with respect to the production, application and export of CFCs and halons are to be found in this Protocol. The Convention for the Conservation of Salmon represents a general exception since neither information gathering nor assessment or licensing obligations are envis-

aged. It must admittedly be remembered that this convention established three regional commissions which can fulfil the essential contractual tasks and issue further regulations.

Implementation reports represent the connecting link between the national implementation of a convention and international verification. International verification refers to these declarations: the truthfulness and plausibility of these national declarations are assessed internationally.

A type of governmental implementation report is required in all conventions and protocols, which is to be transmitted on an international level.¹⁵ In this report, the data obtained and the results of the assessment and licensing processes should be included in the form of specific information about compliance. This report may be more or less formalized. A typical formulation can be found in Art. 8 Par. 7 of the Convention on International Trade in Endangered Species: "Each Party shall prepare periodic reports on its implementation of the present Convention (...)." In some conventions the concept of an implementation report is not mentioned explicitly. Nevertheless, even then the transmission of comprehensive specific data to an international authority is still required. In practice this corresponds to an implementation report since this covers its sense of providing information about compliance. Two examples may be given. Art. 7 of the Whaling Convention states: "The Contracting Governments shall ensure prompt transmission to the International Bureau for Whaling Statistics (...), or to such other body as the Commission may designate, of notifications and statistical and other information required by this convention in such form and manner as may be prescribed by the Commission". The Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft lays down in Art. 11: "Each Contracting Party shall keep, and transmit to the Commission, according to a standard procedure, records of the nature

¹⁵ This concept, which is not used in the conventions studied, is applied here for all types of informations which are to be transmitted on a more or less regular and formalized basis by the countries to an international body in accordance with an agreement.

and the quantities of the substances and materials dumped under permits or approvals issued by that Contracting Party, and of the dates, places and methods of dumping". With the aid of such data, an international commission would therefore be able to draw conclusions about the development of dumping and the causes for changes, which might be found in alternative disposal measures, exports of substances, a reduction in the production of these substances or disposal in violation of the treaty.

An implementation report may appear superfluous for those conventions which lay down the establishment of measuring systems. Thus for example the measuring network along the Rhine would ensure that pollution of the water could be established at any time and compliance would thus be constantly verified by quasi-continuous sampling. Admittedly, the measurements do not directly determine the national origin of the polluter. The cooperation of contracting states upstream would be necessary to identify the polluter. Such a measuring network cannot represent an adequate verification instrument since the (intentional or unintentional) violation of the convention provisions by an individual or corporate body, e.g. by the prohibited dumping of substances, does not in itself refer to compliance on the part of a country. The state can only be held responsible if it permits, or indeed encourages, either negligently or willfully, a violation of the material provisions of the convention.¹⁶ Measurements may therefore only point to events relevant to the convention without this being associated with an evaluation of compliance on the part of the country. The same is also true of monitoring SO₂ emissions. Although the EMEP measuring network is available, nevertheless the Convention and Protocol on Long-Range Transboundary Air Pollution still envisage implementation reports. This does not involve an unnecessary duplication of efforts. The EMEP measuring network collects information both about pollutant concentrations in the

¹⁶ This is the case in every international convention. But this structure of responsibility differs from arms control because the military sector is under governments undivided direction. A violation of an arms control treaty depends on the willingness of a government to break the rule.

air and also emissions and the patterns of transboundary pollutant fluxes, nevertheless a recalculation associating european-wide immissions with national emissions for the purpose of verifying compliance would always remain a *model calculation* and therefore involve uncertainties to a greater or lesser extent. Moreover, the values from national measuring stations which are fed into the EMEP system are only reliable and comparable to a limited extent (Fraenkel 1989:461). At heart, the EMEP is not (yet) a verification system but rather an aid to decision-making enabling optimum national and coordinated strategies for emission reduction.¹⁷ It therefore appears appropriate that countries do not today wish to rely on contentious models in assessing their compliance and place great importance on national implementation reports as the basis for a verification.

By way of summary it may be said that the 13 conventions impose a number of obligations on the member states with respect to the implementation of international agreements, information gathering and reporting on the international level (cf. the figure). This expresses the fact that in view of the wide range of autonomous interests and actors within the member states who must subject themselves to the respective national authorities, internal implementation represents an independent and intractable problem. This internal implementation is not required by arms control conventions to a comparable extent since the military sector is directly controlled by the governments without further autonomous actors as intermediaries. The obligation to present reports is the central prerequisite for international verification, namely the declaration of national measures for implementation and other information which may be relevant for an assessment of compliance. This then leads to the question of how the international verification provisions look like.

¹⁷ It should be in principle possible to use such a model-assisted balancing system for verification purposes. This idea was even considered as long ago as the seventies, cf. Avenhaus 1977:138-160.

The provisions in the conventions and protocols are examined with respect to the following subject areas: establishment of an international organizational infrastructure and allocation of organizational and content functions; statements concerning verification of compliance; regulations respecting a cooperative preparation or provision of information conducive to verification; compilation of international reports on the successful implementation of the conventions; regulations for technology transfer.

All conventions name organizations which take on central importance in the conventions on an international level. They may frequently be special institutions formed by the convention (e.g. the International Whaling Commission). Occasionally, use is made of existing organizational apparatus. Special organizations of the United Nations are of particular significance here: the United Nations Environmental Programme (UNEP cf. Kilian 1987: 234ff) for the Convention for the Protection of the Mediterranean Sea, the Vienna Convention for the Protection of the Ozone Layer, the International Maritime (Consultative) Organization (IMO/IMCO cf. Kilian 1987:156ff) for the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, and Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter as well as the United Nations' ECE (Convention and Protocol on Long-Range Transboundary Air Pollution, cf. Kilian 1987:212ff).

The wide range of organizational regulations in the conventions requires the concepts to be differentiated. As can be seen from the **figure**, a differentiation is made in this paper between the secretariat, commission¹⁸ and conference of the contracting parties.

¹⁸ The Executive Body in the Convention on Long-Range Transboundary Air Pollution is termed a commission here since its tasks are comparable with those of the commissions in the other conventions. Three regional commissions are envisaged in the convention for salmon conservation.

As a rule a secretariat administers the convention: it prepares and convenes meetings of the commission or conference, receives information and distributes it to the members. Verification of the status and implementation of the conventions is either undertaken in a permanent commission composed of representatives of the contracting parties, or a conference of contracting parties meeting on a more or less regular basis. Conventions with a large number of member states generally have both a secretariat and also a commission or a conference of the contracting parties (e.g. the Endangered Species Convention). The considerable administrative apparatus seems to necessitate a separation of organizational and policy tasks. However, secretariats can also be found in conventions with comprehensive fields of action covering the various pollutant groups and emitters (Mediterranean and Baltic Sea Conventions), as well as in conventions with strict subject regulations aiming at a reduction of emissions (Convention and Protocol on Transboundary Air Pollution, Vienna Convention or the Montreal Protocol). The amount of information and the necessary information management could in these cases explain the establishment of a separate secretariat. Only in four conventions does a commission take on both organizational and also policy tasks.

A large number of conventions have therefore developed a differentiated organizational structure in which different tasks are allocated to the various institutions of the convention with respect to verification activities.

The effectiveness and the degree of implementation achieved is examined and assessed in the commissions or conferences in accordance with the provisions of the conventions. The actual verification of countries' compliance should be carried out here and corresponding regulations should be laid down in the conventions. Nevertheless, provisions stipulating a verification of national implementation are as a rule phrased in very general terms, the concepts of "verification" or "compliance monitoring" are not to be found in any of the conventions or protocols under consideration. Statements can, however, still be found dealing with the problem denoted by the concept of

"verification", namely monitoring of contractual implementation and compliance by the member states. However, these statements differ so greatly that a further differentiation with respect to category and subject matter is required.

Only in six conventions do the provisions explicitly indicate that the national implementation reports and other relevant information are to be examined on an international level. The respective formulation in the Convention on Endangered Species (Art. XII Par. 2d) states that "the functions of the secretariat shall be: (...) to study the reports of parties". Art. 14 Par. 2 ii of the Mediterranean Sea Convention stipulates that the conference of the contracting parties shall "consider reports submitted by the Contracting Parties". Such examinations can, with certain reservations (see below), be regarded as a type of verification by audit. Although all other conventions contain general statements about the necessity of monitoring the implementation of the conventions on the international level, nevertheless they do not explicitly refer to the implementation reports (or other data records and information provided), which after all have to be prepared by the member states in all conventions. A typical formulation can be found in Art. 13 of the Convention on the Protection of the Marine Environment of the Baltic Sea Area: "The duties of the Commission shall be: a) To keep the implementation of the present Convention under continuous observation; (...)." Without case studies it is difficult to explain how such a general recommendation can be realized in practice. One hypothesis is that one type of compliance examination has crystallized making use of data both determined internationally (for example from the scientific community) and also provided by the state. This type could similarly represent a sort of report monitoring (*audit*), in which the internationally determined informations are used as comparative figures to national informations.

Apart from the obligation to draw up implementation reports, in seven conventions mention is also made of regulations for further processing and an exchange of information concerning the status and development of the subject of the treaty (e.g.

water and air quality). These regulations seem to aim at a cooperative, international processing of such information primarily serving scientific purposes. However, they could be used to enable further insights into the countries' compliance, for example by creating time series about pollutant emissions for countries. The cooperative compilation of emissions monitoring procedures is regulated in a similar manner and is recommended to all contracting states as an important task. Nevertheless, it must be remembered that these monitoring procedures need not be identical with methods and techniques for verification. The procedures generally aim at the observation, analysis and assessment of the quality of the areas subject to the treaty (environmental analysis and assessment) but not directly at a verification of compliance. Although the application of such monitoring techniques provides indirect indications of the implementation of the convention, nevertheless the verification of compliance by individual countries hardly seems possible since the information obtained does not directly refer to the countries' declarations. But in the long term the establishment of monitoring systems may provide a material (technical) basis for a more "objective", quantitative verification system.

Statements on promoting technology transfer to be found in the Conventions the Baltic Sea, the Mediterranean, Marine Pollution by Dumping of Wastes and Long-Range Transboundary Air Pollution (establishment of the EMEP), the Vienna Convention and the Montreal Protocol (ozone measuring system) are to be regarded in the context described above. This transfer should enable all countries to be in a position to establish their national implementation system (controlling natural and artificial persons), to monitor the subject matter of the treaty and its development in the sense described above. The countries will thus come one step closer not only to control their internal implementation of the convention¹⁹ but also of determining the information necessary for international verification. Only the

¹⁹ Lack of information about internal pollution sources, amounts and trends seems to be a problem for some countries.

Montreal Protocol contains in addition to the requirement for technology transfer, the prohibition of a transfer of technologies to states not a member of the convention. These countries should not be assisted in achieving an increased production and exploitation of CFCs *without* controls.²⁰ This norm represents a new quality because such export restrictions, which run after all contrary to the rules of the free market, have as yet been the preserve of security politics (Ibrügger 1988).

International reports assessing the success of conventions, have only been drawn up for five conventions. It should be examined in detail whether these reports contain immediately apparent or only encoded statements (as in the Safeguards Implementation Report, SIR, of the IAEA) about compliance in the individual countries, or as only comprise general but not country-specific information about the status and development of the subject of the treaty. Previous discussions of the verification provisions in the conventions tend to point to a cautious employment of country-specific assessments or indeed to a complete lack of such evaluations.

Assessment and Conclusions

What insights have been provided by this brief description of the verification system in 13 conventions? To repeat the two central hypothesis of this paper: A form of compliance verification is also to be expected for conventions on environmental protection; the verification rules are consolidated in proportion to the relevance of the subject of the convention.

Rules on the compliance examination by the member states are laid down in the conventions examined. However, they are generally imprecise and not wide ranging. The member states are indeed obliged to make declarations, i.e. they must draw up

²⁰ The Montreal Protocol includes exemptions for developing countries belonging to the convention. These exemptions permit a controlled increase in the production of CFCs and halons.

something like implementation reports containing information about realization of the convention and pass them on to the international body specified in the convention. Nevertheless, what happens to these declarations is by no means clear. The provisions in the conventions with respect to the examination of these declarations are usually formulated in a very general manner: verification of national implementation reports is only explicitly envisaged in six conventions. Such an examination within the international body envisaged for this purpose may be termed "verification by report monitoring" or by "audit". All other conventions only mention an examination of the implementation of the convention which is not further defined. The practical form this examination should take cannot be derived from the conventions. Since in all conventions examined the countries are obliged to provide information or data about implementation, in practice a type of audit is conceivable.

Such agreement differ in many respects from the verification of important multilateral and bilateral arms control conventions:

- The term verification is not used in any of the 13 conventions, all references to the subject verification have therefore been indirectly inferred.
- There are no specific statements with respect to the procedures and methods for verification of compliance. Only through the examination of implementation reports (audit) this point is briefly mentioned. There are no regulations concerning *how* this examination should be carried out in practice. Since none of these conventions envisage an international verification agency to obtain independent information in the member states operating in parallel to the national monitoring and licensing authorities, the national implementation reports cannot be specifically verified with respect to completeness and reliability. Verification of reports by the international bodies established in the convention must therefore in essence be restricted to an examination of the

plausibility of the declarations. In conventions on arms control, in contrast, verification is placed on a level comparable to the material regulations. Remarks on verification are included in the treaties and/or an accompanying document. Verification problems may even prevent or delay the conclusion of agreements.²¹ From the present point of view, this seems unimaginable for environmental conventions.

- The compliance examination in environmental conventions is not implemented by reciprocal, direct verification activities by the member states on the territories of other member countries or by the activities of an international organization (e.g. on the model of the IAEA) in the contracting states. In complete contrast to some multilateral and bilateral conventions on arms control, the examination of international environmental conventions does not envisage any access to national territory and is in general not intrusive. The lack of any national or international inspectors exercising verification activities with their measuring and surveillance instruments in the countries themselves is a central difference, for example, to the Intermediate Nuclear Forces (INF) convention between the USA and the USSR, as well as the NPT. Nevertheless, it is possible to base the compliance examination of environmental conventions in part on report monitoring, a procedure also applied in the verification of arms control agreements (for example the planned chemical weapons convention, cf. Krause 1991). Since the compliance examination of environmental conventions remains restricted to this one procedure, it is - in complete contrast to the numerous instruments of arms control verification - not designed on a redundant basis, it remains one-dimensional and must, in the final

²¹ The conclusion of conventions on a comprehensive atomic test ban (CTBT), a prohibition of the production and possession of chemical weapons (CW convention) and a Strategic Arms Reduction Treaty (START) agreement has come to grief as yet, not least due to verification problems.

analysis, be restricted to a remote diagnosis of compliance due to the lack of access to the member states. Compared with the functions of verification in arms control the environmental treaties' rudimentary system of audit has (in the best case) only weak detection- and deterrence-functions. (The question is how a confidence-building function can be achieved if the compliance monitoring process is so vague.) Using the concept of verification for environmental treaties is only permissible if one is aware of its very special meaning. Applying high arms control standards one could argue that the rudimentary environmental treaties compliance examination is not verification at all.

The above remarks lead to the conclusion that the special status of arms control discussed in the theoretical part of this paper has not yet been overcome with respect to the urgent need for verification. Although the expectation expressed in the first hypothesis that for environmental treaties a type of verification is taking place is not false, nevertheless the verification agreements remain generally very weak: a rapid and unambiguous identification of potential infringements is not likely. In comparison to arms control, the verification provisions in the conventions examined here remain very modest. Only one aspect, report monitoring (audit), seems to be applied as a verification method. The establishment of measuring networks (for example the EMEP) does not serve for verification purposes but is rather a decision-making aid for national measures aimed at emission reduction. Although the Rhine measuring network determines the water quality, nevertheless it remains in essence an early warning system for pollution and thus part of a system for crisis communication and crisis management (Durkee 1989). There are probably no basic *technical* obstacles to the extension of these systems into a more meaningful verification system. The origin of, above all, atmospheric pollutants can be detected with high precision if corresponding efforts are put into the development of coordinated measuring systems and procedures in the individual coun-

tries and adequate software. However, as yet there does not seem to be any political demand for such a system. Expectations concerning the compliance behaviour of countries does not seem to be very prominent in the international environmental protection sector.

Several explanations can be put forward for such weak verification provisions in environmental protection conventions:

- The verification of compliance is so simple and contractual violations so apparent that there is no need for more extensive verification agreements.

This is apparently not always the case since many activities with considerable relevance for the conventions cannot, or only with difficulty, be directly verified by other countries. For example, how can it be established whether, before permission is granted for the dumping of substances in oceans and waters, the samples have been properly examined in the laboratories with respect to prohibited substances; whether the dumping limits for substances have really been observed?

- The contracting states have a high degree of reciprocal confidence since they have comparable political structures and thus little mistrust exists between the individual countries.

If one considers the wide range of different political systems among the large membership of some conventions then this argument is not convincing. It is also contradicted by regulations on the exchange of information, obligations to prepare national implementation reports and precautions for compliance examination by report monitoring laid down in the conventions. There is a need for information providing insights into state action.

- The conventions cover only second-class and third-class issue areas so that (in the final analysis) it is irrele-

vant whether the agreements are (completely) complied with or not.

This argument undoubtedly has its attractions. However, although doubt may be cast upon the environmental benefits of individual conventions, nevertheless, it would be an error of judgment to regard, for example, the Convention on the Baltic Sea, the Endangered Species Convention or indeed the Montreal Protocol as of merely cosmetic significance.²²

- The objective and subjective solidarity of interest between the states leading to the conclusion of environmental production conventions is so convincing and thus the danger of the agreements being bypassed is so slight that verification of compliance plays a very minor or no role.

This argument does have some weight (cf. Efinger/Breitmeier 1991): admittedly, it must be established for each convention whether common interests were genuinely present for its conclusion and implementation. In most of the conventions considered, the interest in the cooperative management of "commons" (oceans, ocean resources) and in a reduction of reciprocal pollution (atmosphere) might indeed be so unambiguous that - if the countries' interests can be coordinated and laid down contractually by mutual consent - there may be no need for extensive verification or verification at all.²³ It is dubious whether these common interests are present at all in the conventions about reduction in CFC production, and particularly with respect to future conventions on the general reduction of anthropogenic greenhouse gas emissions. In these conventions the coun-

²² Thus the CFC production in the (former) Federal Republic of Germany, relative to the greenhouse effect (warming potential), roughly corresponds (in the order of magnitude) to the country's entire CO₂ emissions.

²³ In this connection, it would be interesting to know whether any *relationship* can be determined between the *success of an environmental convention* (measured by an improvement in environmental quality) and the *density of verification provisions*.

tries will have to shoulder considerable burdens and some countries may only be persuaded to join by more or less gentle pressure.²⁴ The position of a free rider profiting from the measures of other countries - without being active oneself - could indeed be attractive.

- A very closely linked argument might help to explain the weakness of verification regulations: environmental protection conventions are to be included in the category of "low" not "high politics". International environmental conventions are not concerned with the international regulation of countries' interests in the field of political issues concerning power and security ("high politics"). The political need for verification would therefore be correspondingly less. However, this would also mean that international environmental policy would have significant security relevance at best in political science theory but not yet in political practice and the actors' perceptions.²⁵ Environmental policies are encompassed within the field of "low politics" concerned with questions of welfare, health etc. and which (in comparison to "high politics" dominated by questions of security and power) are amenable to a high degree of cooperation (cf. Rittberger/Zürn 1990), since the issue area only concerns the choice and application of the most effective means to achieve common aims and not different aims and a change in the balance of power. Such conventions do not need explicit verification regulations since incentives for contractual infringements are slight

²⁴ The threat by some countries, notably the USA, to apply political and economic pressure if necessary to hesitant countries is said to have contributed towards the comparatively rapid conclusion of the Montreal Protocol. The question of sanctions as an instrument for securing international environmental security was recently raised by the German Foreign Minister Genscher in Nordseezeitung, 1.6.1991.

²⁵ Insights into the perception of the security relevance of international environmental policies on the part of elites could be obtained by an empirical investigation. Comparable studies were carried out after the oil crises of the seventies and eighties with a view to economic security.

or lacking. There would be no direct relative or absolute power benefit obtained from bypassing the convention, and indirect advantages, for example as a consequence of diverting investments from an unproductive into productive sectors, would only be conceivable if infringements were substantial and permanent, and if the negative impacts of neglecting the own "long-term production factor environment" were slight. The chances for a gain in power due to an undetected contractual infringement are much more favorable in "high politics".

It may be that none of these arguments on its own explains why the statements on verification are in comparison so nebulous and imprecise. All the aspects discussed may make a contribution. Further, more detailed studies investigating the process of compiling the conventions, the structure of interests and perceptions by the actors, as well as their satisfaction with the verification measures could provide more insights. Nevertheless, the two final arguments, which justify the weakness of verification regulations by factors concerning problem structures, seem to have a high explanatory value. This is particularly true of environmental conventions being assigned to "low politics". International environmental policy is simply not perceived as a security-relevant issue area.

If one considers further factors affecting the verification system then the number of contracting parties undoubtedly influences the organizational structure: secretariats are established to deal with the day-to-day work. It is not clear whether this has an impact on the verification agreements. Thus both the Conventions on Long-Range Transboundary Air Pollution with only about two dozen members and the Montreal Protocol with three times as many are characterized by comparatively "dense" verification regulations. The number of member states does not seem to affect the verification provisions. More detailed investigations should examine whether the political composition of the member states affects the need for verification. This problem has been briefly mentioned above. The plau-

sible hypothesis that the political composition of the membership is of little significance since agreements can be made for problems of "low politics" across systems boundaries with relatively little difficulty does not appear to promise any new insights.

If the hypothesis is accepted *that international environmental policy either does not objectively affect any political field relevant to security or power politics or else is not perceived as a security policy and therefore there is at best little (but not necessarily no) need for verification*, the question then arises of the extent to which the evolution of the security concept in the theoretical part of this paper is in fact justifiable (cf. Deudney 1990). This question can only be raised here but not answered in detail. The discussion of the environment and security has only recently gained momentum and objective interlinkages between the "traditional" security concept and the environment have not yet been precisely defined, and initial attempts at a more concrete determination of the endangerment of national and international security by anthropogenic interference in the environment still remain unsatisfactory.

Nevertheless, there are some strong arguments pointing to a gradual development in the interlinkage of security and the environment. Because of the investment necessities the two conventions which aim at an elimination of SO₂ emissions and CFC production may already have reached a point at which power questions could be involved. Above all the discussion on a convention to reduce greenhouse gas emissions seems to be moving in this direction: The economic burden on the countries by the measures for reducing GHG emissions (which is at the moment difficult to calculate), which lead to the free rider position becoming quite attractive, will probably take on such dimensions that repercussions on the countries' power positions are not to be dismissed out of hand.²⁶ If a GHG convention thus falls within the scope of "high politics" then a demand for

²⁶ "Noncompliance appears more attractive as the probability that signatories will have to pay the economic costs imposed by international environmental agreements increases." (Hahn/Richards 1989: 437).

international verification far beyond that of present environmental protection conventions will probably result (Efinger/Breitmeier 1991). The second hypothesis of this paper starting from a positive relationship between the object to be regulated and verification should therefore not be rejected too rashly.

A growing demand for the verification of such a convention can also be derived from the natural properties of GHGs. Because of their long life times GHGs are distributed uniformly throughout the entire breadth of the atmosphere so that the country with the highest GHG emissions is nevertheless not affected overproportionately (i.e. the GHGs are not concentrated on its territory). In contrast to the case of SO₂ or NO_x, there is no direct incentive to reduce national GHG emissions for the sake of reducing immissions (and thus the future hypothetical²⁷ damage) in one's own country. The position of free rider is therefore in general more interesting for the GHGs than in the sector of SO₂ and NO_x emissions since it is also possible to profit from emission reductions in distant countries. The direct, primary common interests of countries becomes less effective if one can rely on emission reductions even in distant countries. Nevertheless, if it is possible to connect a country's own interest in reducing, for example, national SO₂, NO_x and dust emissions and immissions with the aim of protecting global commons (reduction of GHG emissions in atmosphere),²⁸ then this may ease the necessity of strict verification provisions.²⁹

If one assumes that future international conventions on environmental protection will be subject to stricter verification

²⁷ The anthropogenic greenhouse effect is still a forecast based on more or less shaky climate models. Measured climate variations are still within the boundaries of natural climatic variations. Therefore the GHG-problems differs from the rather well known and measured processes of stratospheric ozone depletion.

²⁸ For China cf. Kappel/Staub (1989) and Chandler (1988).

²⁹ If, as claimed, the increase in energy efficiency in industrialized countries is profitable in economic terms, the incentive for compliance (rational actors assumed) should be very high.

regulations than has been the case in agreements concluded to date then the question also arises of the competence of international institutions.

In principle an international institution could also undertake tasks in implementing the treaties in the member states, in addition to its verification mission. However, previous experience does not indicate that in the near future countries will be prepared to delegate national competences for the verification *and* implementation of environmental measures to inspectors operating on behalf of the UN Security Council, the UNEP or any other international organization ("green helmet").³⁰ The internal implementation of conventions will continue to remain a national task separate from questions of verification in which the international organizations could, in principle, take on a central function. A different development is, however, conceivable for international verification. In order to achieve a more consolidated system for the international verification of environmental protection conventions, the verification processes would have to go beyond the report monitoring envisaged at present. Not only the establishment of an international safeguards organization to monitor, for example, the observation of obligations within the framework of a GHG convention would be conceivable but also other approaches towards verifying compliance. Fact-finding commissions undertaking researches in the member countries of a convention could therefore independently compile information and data of use in estimating and assessing national declarations. (Such fact-finding missions are currently sponsored by the UN in the field of verifying the implementation of human rights conventions, for instance.) Their tasks would have to be laid down in the international environmental protection conventions and the final report would have to comment on statements of national declarations since it is only possible to verify that which has been declared by the countries (in accordance with the contractual agreement).

³⁰ The employment of such inspectors on the high seas for marine protection, i.e. outside the countries' national territory, would admittedly be conceivable; cf. for a discussion of the institutional form and scope of international environmental controls: Schreiber 1989.

Nevertheless, the density of verification demands for environmental convention need not correspond to that of arms control conventions. The risks for the international community associated with an infringement remain for the foreseeable future less than in arms control and in practice the possibility of detection greater. That is not due to compliance examination provisions but to societal processes: Not only the media but (not least) the scientific community, at least in democratic countries, can make a contribution to this process. Furthermore, even today there are a wide range of non-governmental environmental movements (NGOs), also organized on a transnational basis, which have at their disposal highly developed structures of their own for gathering, processing and disseminating information, and also make use of their own measuring systems capable of providing precise information (e.g. WRI, WWF, Greenpeace etc.). In particular the reforms in Eastern Europe, the USSR and the "South" will enable such social activities to expand which may result in a dramatic increase in the level of information. An expansion and inclusion of these activities in international law (Sands 1989) could be conceivable in parallel to the growing significance of non-governmental transnational activities in the international system. In the same way, countries may entrust neutral experts or "trust companies" with the compilation of reports on compliance in their own countries and with transmission to an international agency in order to give the declarations "more independence". In this way an informal, *social verification* might develop (Feldman 1990:51).

Nevertheless, as yet international verification has existed through the acceptance of verification regulations in the individual countries. As yet precise, contractual definitions and allocations of competence have been preferred in this sensitive political area to non-institutionalized, non-governmental activities. However, it would be conceivable that the verification concept could be expanded to include a level of social control. Such a perspective could also be encouraged by an

important structural element from which an important difference between infringements of international environmental conventions and of arms control conventions could be derived: the latter must be acts of national policy whereas environmental offences are frequently committed by autonomous economic units (enterprises, individuals) against the government's will.

SYNOPSIS: THE VERIFICATION OF INTERNATIONAL ENVIRONMENTAL TREATIES

Inter- national Con- vention	NATIONAL LEVEL					INTERNATIONAL LEVEL						LEVEL			In force since (number of member countries)	
	Implemen- tation Authority	Collection of data/in- formation	Examination and Approval	Measure- ment Systems	Implemen- tation Report	Organization			Examination Implemen- tation Rep.	Unspecified Examination Impl. Repo.	Exchange of Infor- mation	Development Monitoring Systems	Drawing up Reports of Success	Technology-Transfer		
						Secretariat	Commission	Conference						Restriction		Support
Regulation of Whaling* Convention																1948 (45)
Endangered species Convention																1975 (103)
Salmon con- servation in the Atlantic																1983 (7)**
Marine pollut from ship/air craft dump.																1974 (13)
Marine pollut from waste dumping*																1975 (61)
Protection of of Medite- ranian Sea*																1976 (18)**
Marine pol- lution from land sources																1978 (14)**
Protection of the Baltic Sea																1980 (7)
Convention on transboundary Air Pollution																1983 (34)**
Protocol on transboundary Air Pollution																1987 (21)**
Convention Protection of Ozone Layer																1987 (41)**
Montreal Pro- tocol Protec. Ozone Layer																1989 (46)**
Convention f. Protection of the Rhine																1979 (6)**

*including further Protocols
**including European Community

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