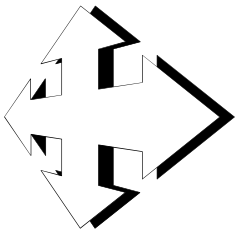

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Experiences in the Measurement of Regulation Compliance

Final Report

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Chapter 1

INTRODUCTION

Circum *Network* was asked to compile useful experiences in the measurement of regulation compliance in the general context of Environment Canada's performance reporting and this department's participation to the Commission for Environmental Cooperation project on compliance indicators. This assignment specifically excludes performance measurement. The main research questions are:

① How is compliance defined? What are the sub-dimensions of compliance which must be represented in its measurement?
② How can the various sub-dimensions of compliance be measured? What are the reefs which must be avoided and how can they be avoided?
③ How can experiences from other organizations apply to Environment Canada ?

The following approaches were used:

① a review of documentation from central agencies in the Government of Canada;

② a review of documents from provincial departments and agencies in Canada;
③ an analysis of Canadian, non-governmental sources such as university files or non-profit organizations;
④ an in-depth profile of current data collection activities in six strategically-chosen organisations dealing in the realm of regulation and compliance; and
⑤ a few interviews within Environment Canada to position the problem of compliance measurement and to verify the applicability of measurement models from elsewhere.

First, this report presents some fundamental concepts which are important in understanding the difficulty of measuring regulation compliance. Second, experiences from various organisations are presented. Third, some lessons are drawn with regard to the valid and reliable measurement of compliance.

Chapter 2

CONCEPTUAL BACKDROP

2.1 Definition of Compliance

According to Justice Canada, compliance refers to the continuing conformity of the regulated group or a member of that group with the prescribed regulatory standards (Department of Justice, 1994, cited in Transport Canada, 1998).

2.2 Dimensions of Compliance

Compliance and, even more, non-compliance are multi-dimensional concepts. At least five aspects must be determined to fully qualify the level of non-compliance:

- the ***environmental risk factor*** or the violation impact: not all non-compliant actions present equal risks; as Volokh (1997) puts it "A one-time permit exceedence involving a low-level, low-toxicity pollutant in an uninhabited area is not the same as dumping a highly poisonous chemical into the water supply near a major city". The Canadian Standards Association has outlined a process to assess risk.[1]

- the ***reason for non-compliance***: intentional non-compliance meant to generate an economic profit is different from accidental non-compliance, non-compliance due to ignorance and non-compliance due to lack of knowledge of the regulation (this being said at a conceptual level, without reference to the legal concept of due diligence). "The enforcement or measurement action should be based on the percent deviation and a company's intent or lack of willingness to comply, as well as the case where an intentional violation occurs" (Huffman, 1997)

- the ***legislation***: in the realm of the environment, non-compliance may relate to water pollution, air pollution, wildlife, endangered species, hazardous waste, etc.

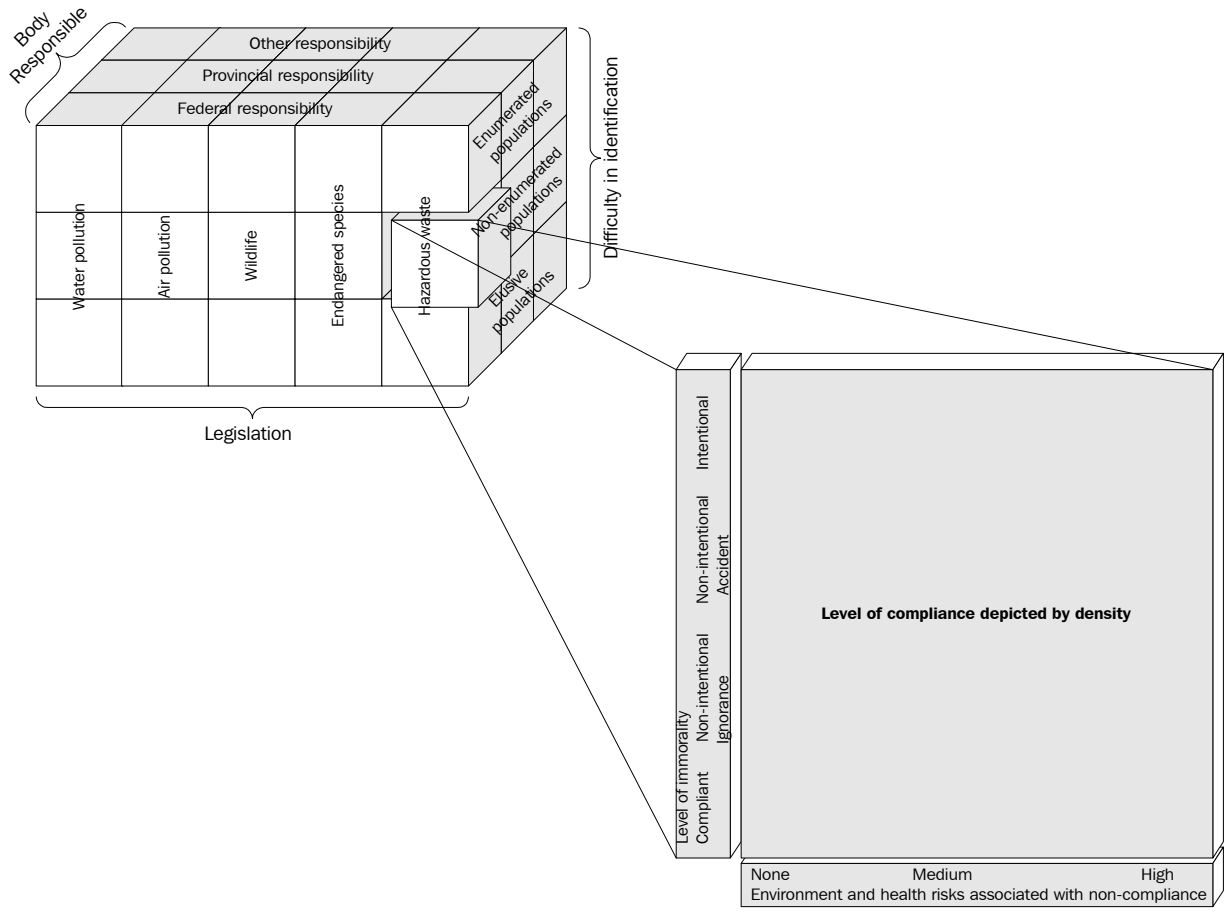
- the ***body responsible*** for regulation enforcement: action against non-compliance may be the responsibility of the various levels of governments.

- the ***difficulty in identifying regulated community members***: it is vastly easier to measure compliance when the regulated community is known and static (e.g., pulp-and-paper mills) than when it is not enumerated (e.g., hunters) or when it is elusive (e.g., smugglers).

The measure of compliance can take various forms (USEPA, 1997c): output-based or outcome-based, quantitative or qualitative, statistical or narrative, aggregated or disaggregated, national or local.

[1] See Canadian Standards Association, *CSA 850 Risk Management: Guideline for Decision-Makers*, 1995 and *CSA Q634 Risk Analysis Requirements and Guidelines*, 1991

EXHIBIT 2.1
Dimensions of Compliance



2.3 Enforcement Performance vs. Compliance

This study is an attempt at identifying practical, useful and innovative ways to measure the level of compliance with regulations. It is crucial to distinguish a number of concepts in the regulation enforcement environment:

- ***resources*** are the inputs in the enforcement process; they include money, time, equipment, etc.
- ***activities*** are the means to transform the inputs into outputs; they include inspections, monitoring systems, self-declaration, etc.[1]
- ***operational results*** are the immediate results of the activities; they include prosecutions, enforcement cases, penalties, compliance orders, incident reports, etc.[2]
- ***immediate impacts*** are the first level effects of operational results; they include actions taken by violators to return to compliance[3]
- ***ultimate impacts*** are the final effects of the entire system of regulation and enforcement; they include compliance with regulation, the state of the regulation target (e.g., the quality of the environment), etc.[4]

Most of the efforts found in organisations and in written documentation aim at measuring ***enforcement performance***, hence the operational results and the immediate impacts which are directly related to the enforcement programs — this is mainly attempting to measure the change

1 Classified as "outputs" in recent USEPA documents

2 Classified as "outputs" in recent USEPA documents

3 Classified as "outcomes" in recent USEPA documents

4 Classified as either "outcome" or "environmental indicators" in recent USEPA documents

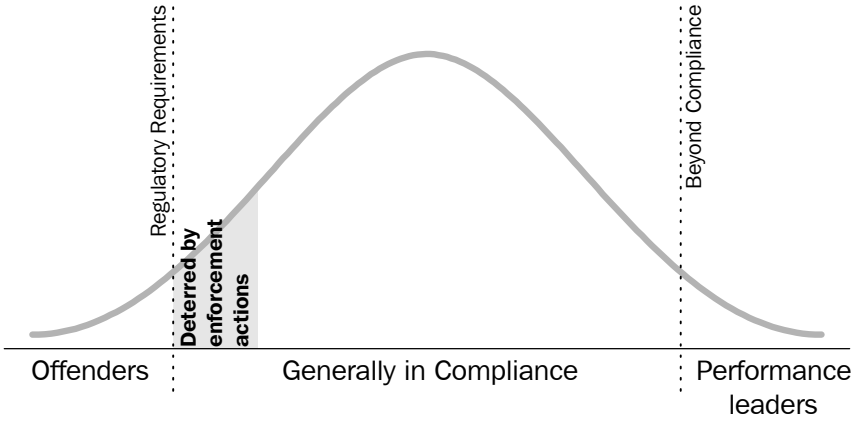
attributable to the enforcement plan. In contrast, the topic of this assignment is the measurement of ***compliance*** which is a multidimensional concept but a static one — we are not going to be measuring change, but rather states. Of course, the description of successive states will depict change but each measurement will be about state, not change, whereas enforcement performance is about measuring change (e.g., *improvement* in compliance) and, possibly, change in change.

2.4 Distribution of Compliance

Environment Canada's *Compliance and Enforcement National Program, Component Action Plan* (1998) offers the following conceptual insights.

> Most individuals and companies comply with environmental laws. The universe of regulatees can be pictured as a Distribution Curve. The majority of the regulatees maintain a level of compliance which would make them remain in the middle of the curve. These regulatees, with some incentive, comply voluntarily with the regulations. Performance leaders on the right side of the curve constitute a small group of regulatees who have moved well beyond simply complying with the regulation. The group located at the left side of the curve is the focus of the program's attention. The lightly shaded area represents the portion of the regulated community who is in compliance but who will become non-compliant if they see no deterrent. Therefore, this group is very influenced by our actions. It is a generally accepted rule of thumb that 80% of violations are caused by 20% of the regulatees

EXHIBIT 2.2
Distribution of the Regulated Population



2.5 *Tenets of Modern Measurement*

This study is about the measurement of regularity compliance. So far, we have emphasized the "compliance" side of this equation. Let's turn to the "measurement" side for a while. Measurement of government achievements takes place to inform government processes about their performance and to give background to population representations. As such, measurement is not socially neutral but the social scientist designing measurement systems strives to impose some methodological rules to limit the role of values and judgement and to ease the comparisons through time, space and areas of regulation.

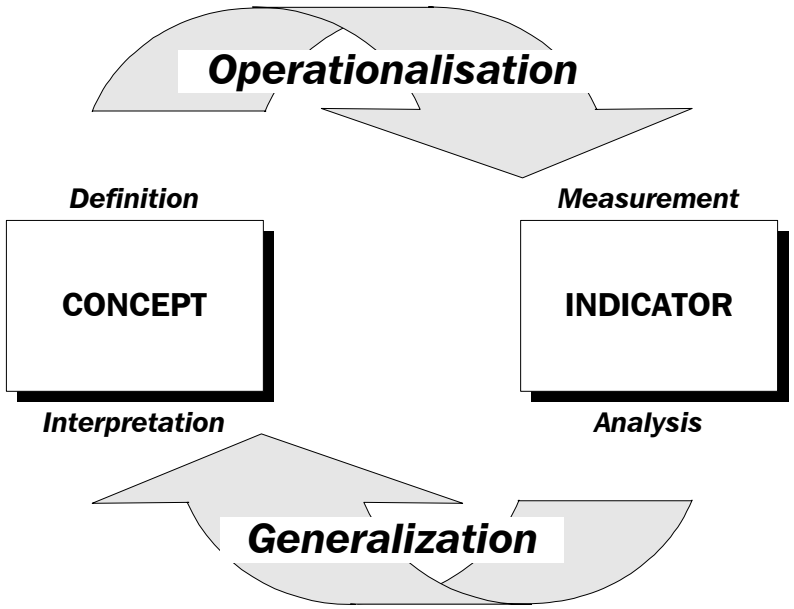
At a methodological level, Carmines and Zeller (1979) note:

> The notion that measurement is crucial to science seems a commonplace and unexceptional observation. Most book-length treatments of the philosophy of science include a discussion of the topic. And books focusing on research methods invariably have a chapter dealing with the problems associated with measurement. Yet, the widespread acknowledgment of the importance of good

> measurement has not — until quite recently — led to the development of systematic and general approached to measurement in the social sciences. Quite the contrary, historically, measurement has been more of an abstract, almost ritualistic concern instead of being an integral and central aspect of the social sciences. [...]
>
> In other words, measurement is most usefully viewed as the process of linking abstract concepts to empirical indicants, and as a process involving an explicit organized plan for classifying (and often quantifying) the particular sense data at hand — the indicants — in terms of the general concept in the researcher's mind.
>
> This definition makes it clear that measurement is a process involving both theoretical as well as empirical considerations. From an empirical standpoint, the focus is on the *observable response* — whether it takes the form of a mark on a self-administered questionnaire, the behavior recorded in an observational study, or the answer given to an interviewer. Theoretically, interest lies in the *underlying unobservable* (and directly unmeasurable) *concept* that is represented by the response. Thus, using the above examples, the "mark" may represent one's level of self-esteem, the "behavior" may indicate one's level of personal integration during a conflict situation, and the "answer" may signify one's attitude toward President Carter. Measurement focuses on the crucial relationship between the empirically grounded indicator(s) — that is, the observable response — and the underlying unobservable concept(s).

Hence, "regulatory compliance" is the concept that we are attempting to measure using related states and behaviour. Durand and Blais proposed a representation of the measurement process (see Exhibit 2.3).

EXHIBIT 2.3
Two Steps in Measurement



Measurement starts with the definition of a concept — in this case "compliance", defined in an earlier section. Through a process of operationalisation, the concept is *translated* into an indicator — the indicator is the series of operations which is required to collect empirical information which is *representative* of the concept under study. Note that the measurement literature is unequivocal about the fact that measurement is an *approximation* of the actual concept the researcher attempts to represent and that, often times, the indicator will be an indirect proxi for the concept (e.g., driver's licence tests are indirect methods to ascertain one's capacity to drive a vehicle). Once measurement has taken place, a process of generalization must take place to undo the

operationalisation process and return to a discussion of findings at the conceptual level (e.g., the researcher as well as the manager need to conclude on "compliance" as a concept, not on the level of compliance measured through one means or the other); analysis and interpretation are paramount in this generalization process.

No operationalisation procedure is perfect and no indicator is without flaw. In general, four criteria are used to assess indicators. They could be used to evaluate various compliance measurement strategies.

- ***Validity***. Validity is the most all-encompassing criterion of the four. It is defined as "a term to describe a measurement instrument or test that measures what it is supposed to measure; the extent to which a measure is free of systematic error" (Vogt, 1993). A valid measurement can be related back to the concept on the basis of its content, its construct, or its predictive power. Basically, though, the idea is that a measurement that can be directly related to the concept, in a valid manner, will be a better gauge of the concept than one that cannot. As Vogt puts it, "say we want to measure individuals' heights. If all we had was a bathroom scale, we could ask our individuals to step on the scale and record the results. Even if the measurements were highly reliable [see below], that is, consistent from one weighting to the next, they would not be very valid. The weights wouldn't be completely useless, however, because there generally is some correlation between height and weight. Although we do often have to try to get by with proxy measures, there is no doubt that a yardstick would be more valid for measuring height than a scale."

- ***Reliability***. "Fundamentally, reliability concerns the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials" (Carminen and Zeller, 1979). Reliability encompasses three dimensions: *stability* or the capacity of a measuring tool to provide the same reading given two similar situations, *consistency* or the ability of two instruments to return the same reading of the same situation, and *sensitivity*, or the characteristic of an instrument which will correctly distinguish

different situations. Applied to the regulatory compliance world, we would give more credence to a measurement of compliance which would provide similar ratings over time given that the situation has not changed, and also more credence to a measurement which would allow us to observe a difference in compliance between two situations or geographical areas where there really is a difference.

- ***Non-contamination***. Blais (1992) insists on the importance of non-contamination in an indicator, i.e., the characteristic of a measurement tool which does not affect the object of measurement. Arguably, measuring one's height does not change the actual person's height. However, it has been argued that planned inspections of sites or inspectors' visits to fisheries modify the natural behaviour being observed. Theoretically, a non-contaminating indicator is preferable to one that contaminates the object of measurement.

- ***Precision***. Also referred to as intersubjectivity, precision is the characteristic of an indicator which can be completely described so as to allow replication by another researcher. All aspects of sampling and observational procedures must be clearly outlined so as to allow scrutiny and criticism. Obviously, measurement which uses covert activities can hardly comply with the precision criterion.

It is generally accepted that researchers should strive to maximize validity, reliability, non-contamination and precision to all extent possible, and that one measurement which fares better on these counts should be preferred over one which does not. These four criteria could become the basis for analysis and decision on compliance indicators.

2.6 Catalog of Options

The monitoring and measurement of compliance can be done in a number of ways. A study conducted at Transport Canada (1990) lists the following options to foster compliance:

- Government inspections:
  - 100% inspections
  - random sample
  - scheduled sample
  - targeted sample
  - quality assurance[1]
  - auditing of compliance
  - auditing of inspection
  - product testing
  - automated monitoring
  - foreign government inspection
- Investigations:
  - upon complaints
  - upon incidents
  - after inspection
- Reporting and information system
  - manual
  - automated
- Self-determined monitoring
  - regulatee-run quality control program
  - voluntarily providing samples
  - employer/employee commitment
  - quality management
- Third party monitoring
  - regulated community associations
  - other associations
  - insurance companies
  - private firms
  - other governments/departments

The report analysed the practices in eleven federal regulatory programs and concluded that the three most common strategies were: government inspections, government investigations and reporting and information systems.

[1] Quality assurance is defined as the process of auditing the regulatee's processes to determine their level of quality, assuming that quality processes equate to compliant processes.

A more recent Transport Canada (1998) document suggests the following list of monitoring tools:

- record-keeping;
- internal (to the regulated community) monitoring agency or committee;
- reporting requirements;
- notification of potential violations (by the regulated community member);
- pre-notification of proposed actions (by the member of the regulated community);
- routine inspection;
- inspections not "for cause" and investigations "for cause";
- audits; and
- third-party monitoring.

Chapter 3

EXPERIENCES

3.1 United States Environmental Protection Agency

In its most recent documentation, the USEPA (1997c) describes the eleven sets of performance measures it intends to use to assess enforcement performance in coming years. These sets of actions deal with the outcome and output dimensions (which correspond to our operational results and immediate impacts). One of these sets deals specifically with the "levels of compliance in regulated populations". Four measures of compliance are proposed:

- the rates of compliance for regulated populations in which the entire population is inspected;
- the rates of compliance from self-reported compliance information;
- the rates of compliance for populations that are targeted for special initiatives (the USEPA recognizes that "these samples are not capable

of producing rates which are statistically valid and representative of the whole sector"); and,

- the rates of compliance inferred from random sample inspections carried out on five to ten sectors per year to produce statistically valid compliance rates and supplement the other three sources.

While the third approach does not produce statistically valid compliance rates, the other three approaches do (to the extent that self-reporting is accurate and timely). Note that this plan does not include the qualification of the nature and seriousness of non-compliance. In particular, it does not address the issue of ill-defined and elusive regulated populations.

3.2 Transport Canada — Transportation of Dangerous Goods

Program description[1]: "Transportation of Dangerous Goods" is a public safety legislation which covers all modes of transportation in all geographic areas in Canada. It includes transport by air, rail, marine and road.

Defining compliance. The program defines compliance as 100% compliance with all regulations in every inspection. The statute is mandatory and immediate, meaning that the offence has to be rectified without delay. Offenders do not have the option of coming back at a later date and showing the problem to be fixed.

This definition is seen as imperfect because it does not necessarily reflect a true picture of compliance. For example, using this definition compliance with the regulation runs at between 45% and 50%. Thus, 50% to 55% of inspections find at least one major infraction . Whether there are 2 or 10 infractions, it is reported as one incidence of non-compliance.

1 Key informant: Robert Thomason, Director of Compliance and Operations, Transportation of Dangerous Goods, Transport Canada

Measuring Risk. The current system for measuring compliance does not take risk into consideration. The program undertook to differentiate major from minor risks and then removed those aspects that were considered low risk from the compliance reporting process. This was done through a three-year process where inspectors rated the seriousness or risk level of each offence. The offences collectively deemed to have little impact on response have been dropped from compliance measurement. For example, some paper work offences (e.g., indicating the packing group 1, 2 or 3 in arabic rather than roman numerals) were deemed to be less serious than offences related to containers.

Capturing reasons for non-compliance. Reasons for non-compliance are not coded and reported nationally. At a regional level, reasons for non-compliance may be collected when a member of the regulated community accepts to work with an inspector to determine the sources of non-compliance but this process is optional. Thus, no systematic non-compliance reason data are available.

Regulated population. The regulated population includes everyone who ships or receives dangerous goods. Movements amount to 27 million a year; they have increased rapidly, by 12% annually, recently. The number of movements is not known in advance but it is finite and fairly predictable.

Sampling strategy and research methods. There are 35 multi-modal inspectors, each capable of doing 200 inspections per year. This means that about 0.03% of shipments are inspected. The Director does not believe that results obtained in this way can be extrapolated to the rest of the population. Program operations have determined that if something is packaged correctly at the place of origin, it has a much greater chance of making it through the whole system, so the energies of the inspectors are put on the shippers and the front-end packing process. All activities with regard to data collection around compliance are directed from the region with HQ providing functional guidance.

The program has agreements with a number of related stakeholders to undertake inspections on their behalf. The provinces monitor highways; Environment Canada looks at hazardous waste; the rail system and airlines

also have inspectors that perform this task along with their regular duties. Personnel from the rail safety group, the air sector, Environment Canada, Natural Resources Canada and Atomic Energy Control Board of Canada have all been trained by Transport Canada to standardize the inspection process.

Data collection. The Department has a stand-alone Inspection Information System that their 35 inspectors feed into on an ongoing basis. Infractions detected by air or rail inspectors will only be reported to the Director if an enforcement action is taken. It is at the discretion of the person performing the on-site inspection which intervention approach is taken. The central data collection point is the office of the Director who reviews data and provides functional direction. If, for example, he sees a number of incidents related to one type of container, he will flag this issue across the system. It is not reported out in any way. Regions all know what their rate is from their own input, but do not receive data from other regions.

There is no link between data collected with regard to compliance with this program, with other parts of the Department. While there are many other compliance issues, each program is seen to be directed at different people for different reasons. For example, road compliance is directed at manufacturers of automobiles; rail safety is directed at the safe operation of the railway. The variety of approaches may be explained by the differences in programs and statutes, the ensuing differences in program structures and the varying periods when the programs were initiated.

Results of compliance measurement on performance. Program management recognizes the difficulty of measuring the impact of their actions on compliance. If highway accidents decrease, is it because the speed limit was decreased, or that increased awareness of the program had an impact?

References. "Compliance Program Strategy" in Transportation of Dangerous Goods Inspector Manual, March 1998 (3 pages)

3.3 Transport Canada — Railway Safety

Transport Canada's Railway Safety program has been the object of intense scrutiny since 1994. A specialised project team has recently released a report dealing, in part, with regulatory compliance mechanisms in this program. Early on, the report (Transport Canada, 1998) states that "Transport Canada does not have a comprehensive system for capturing compliance data from inspection and audit activities. Limited analysis is performed with existing data due to resource pressures." The report later suggests that program performance tracking would require:

- performance indicators to monitor safety performance and identify safety trends;
- independent audits of the performance of each railway safety management system;
- inspections as performance tracking tool; and,
- supervision and management controls.

As part of the study, Transport Canada analyse railway safety systems in twelve countries. Among other things, it was discovered that four offer no data related to compliance; five produce data on incidents only; and three register data on inspection results. Thus, in these twelve countries, only three assemble data at least marginally related to compliance and all three use operational indicators.

3.4 Fisheries and Oceans Canada

Program description[1]: The system described here covers both Fisheries and Habitat regulations – Sections 35 and 36.

[1] Dennis Brock, Director, Conservation and Protection, Enforcement Branch, Fisheries and Oceans

Defining compliance. Compliance is defined as being 100% in compliance with Conservation and Protection regulations. Non-compliance is therefore determined by dividing the number of persons warned or charged by the number of persons checked (if 14,000 aboriginal fishers are checked, and 100 are found to be non-compliant with any of the regulations, the reported compliance rate is 98%).

Capturing reasons for non-compliance. The system now being installed cannot get at the reason for noncompliance (e.g., financial gain rather than lack of knowledge). Departmental officials believe however that it will be possible to develop a model which will analyse compliance behaviour in more depth, but they are just beginning to think about the elements that would need to be included.

Sampling strategy and research methods. The department is currently developing a system and plans a pilot in the Fraser river area this year. Enforcement officers check individuals and vessels in each fishery area. Data are collected weekly from officers engaged in enforcement in each fishery.

Data collection. Until recently, the Department did not keep track of the number of people checked, and was hence unable to provide compliance figures. Over the past eight years, the Department has been developing a national, department-wide system that began to be rolled out in 1996 and which makes these linkages. It tracks violations reported, and the data may come from one of the C&P officers or from the Observe, Record, Report Program (a 1-800 reporting system for private citizens and concerned fishermen). The system basically captures incident reports — both warnings and charges. It currently contains about 3,000 records. According to officials, there remain a lot of issues on how to use and interpret the information captured, and in particular how to extrapolate the data to the whole population. "Unless we do a 100% sample instantanteously, we can't detect compliance in a whole population. Once a government aircraft is seen, or an officer arrives on dock, fishermen behavior changes..." They base compliance reporting on the people who have actually been checked and assume that this is the norm for the population.

Others, particularly the media, contest the information that is provided based on the data collected. For example C&P data show that aboriginal fishers in the Fraser River are 98% compliant. The accuracy of that figure is in dispute. The Department is now considering ways to calibrate the accuracy of the data by undertaking parallel qualitative research. Such a project was undertaken in the early 90's, whereby an academic researcher conducted an intensive survey of fishermen to get their views and then tried to correlate these findings with the compliance information that DFO was turning out. In the study, fishermen said that there was a lot more illegal catch going on than the data indicated. However, Departmental officials doubted the consistency of the field operation data that the system in existence at the time produced. The Department subsequently invested heavily in improving its own data (as described above) and is now preparing to return to the qualitative research model as a secondary information resource.

The system is able to track violations by type (e.g, habitat violations), by regulation, by region, by officer. The system will enable the construction of a national picture, comparing for example how many habitat violations there are in the Pacific region vs. the East coast. The system was designed for integration with other data bases beyond the Conservation and Protection Enforcement Branch. This would include for example the licensing data base for all ocean vessels, and the catch data system relating to quotas.

It also tracks internal operational data — the number of hours that are expended by each officer by platform type, e.g., number of vehicle controls, air patrols, boat patrols, to determine which is the most effective mode. Departmental officials hope to be able to compare effort and output in order to help determine the best mix of resources and frequency of checks.

One operational problem with data management at present is that 70% of officers are in remote locations and don't have immediate access to Internet service. Once this is addressed, the next step will be to build analytical tools that enable them to derive the best information from the data.

Overt observation. One means used to get more information on illegal activities of the licensed population is the placement of overt observers on a certain proportion of any one fleet (the percentage varies from 5% of the fleet to total coverage depending on the level of risk). The overt observers report on their findings, and data from observed vessels is compared with data from the unobserved portion of the fleet (based on inspections). This may give some indication of the level of illegal activity. For example, if observed vessel come in with a large proportion of small fish and the non observed vessels only have large fish, this may indicate that there has been some illegal dumping of small fish at sea. Obviously, with a known observer on board, fishers can manipulate where they fish, so it is not an exact science. There are 200 to 300 such observers working at any one time.

Reports and publications. *Post Season Analysis, 1996 - Calculating non-compliance rate*s (overhead presentation)

3.5 Citizenship and Immigration Canada

Program description[1]: Port of Entry management in Citizenship and Immigration Canada (CIC) focuses on ensuring that everyone who crosses the border into Canada is in compliance with Immigration Regulations — that is to say they are properly documented as Canadian citizens, or have permission to enter the country under another status (refugee, visitor, etc.). An important aspect of the program is that CIC is not the primary line of enforcement. People are first met by a Customs officer who ensures that travellers are Canadian citizens or are otherwise properly documented. If they are not, the traveller is then referred to an Immigration officer.

CIC has a Memorandum of Understanding with Customs which spells out the circumstances in which people are supposed to be referred to CIC. One

[1] Manuel Pereira, Program Officer with Port of Entry Management Division, Enforcement Branch, Citizenship and Immigration Canada

of the responsibilities of CIC in return is the provision of training to Customs Officers.

Regulated population. The regulated population consists of every individual who crosses the border into Canada legally or illegally. The Department currently has no means of estimating the volume of illegal immigration or non-compliant entries.

The reporting of inadmissible persons on the FOSS system (described below) is a measure only of those discovered to be non-compliant on attempts to enter Canada. The Department has no sense of the numbers of non-compliers that get through the gate for a number of reasons. Firstly, our land borders are very open, and some roads into Canada have no customs clearance facilities at all. Also, people who are in Canada illegally are unlikely to present themselves once here. Random investigations are undertaken by way of employers and in conjunction with the police who CIC also trains on matters related citizenship and immigration. In addition, CIC is sometimes fed information from the general public. Cumulatively these sources turn up a number of cases which were non-compliant on entering Canada, but provide no basis for calculating the size of the larger pool of which they are a sample.

Data collection. Data on non-compliance is collected on an ongoing basis through the formal reporting of persons who are inadmissible to Canada (known as "Section 20" reports). These reports are compiled by Immigration officers at ports of entry and entered into the Field Operations Support System (FOSS). This data is gathered by the Enforcement Branch and is the basis for a number of statistical reports. Reports are produced as required, but may be aggregated by entry point (e.g., land, airports), by the number of admissions and refusals, the number of refugee claims, etc.

No attempt is made to extrapolate the results of this reporting process (whereby 5% to 7% of those attempting to enter the country are deemed to be improperly documented) to a more comprehensive statement about the overall level of compliance with Immigration regulations.

Ad hoc studies. Aside from the reporting on all cases of non-compliance that the system finds, the Department occasionally invests in measuring and assessing the quality of their system. Since the quality of the program is critically dependent on Customs referring the right people to CIC, this aspect has been more a focus of research than measures of compliance itself. (The latter is deemed to be a close to impossible task).

Ad hoc studies aimed at testing the quality of the process by which non-compliance is identified are undertaken on a one-off, occasional basis. In 1991 for example, Employment and Immigration Canada hired a consultant to undertake a research project to assess the quality of the process used by Customs to identify and refer improperly documented people to the Immigration officer (for secondary examination). A systematic sample of travellers entering Canada was selected by a research assistant. After the regular non-immigration portions of the entry interview (Customs, Health Canada, Agriculture Canada), sampled cases were sent to Immigration secondary for full blown processing. This sample revealed the proportion of travellers who are indeed inadmissible into Canada (assuming that the Immigration officer is capable of rightly identifying non-eligible cases in the context of a formal and monitored secondary interview, a safe assumption). Moreover, it was possible to compute the performance of Customs officers in identifying travellers requiring secondary Immigration assessment by computing the ratio of the proportion of cases found inadmissible under normal procedures (the simple ratio of inadmissible cases to total traffic) to the proportion of cases found inadmissible in the study sample.

The second tier of the traveller screening and examination process at points of entry is the examination carried out by the Immigration officer. In another *ad hoc* study, an external consultant and Employment and Immigration Canada trained six actors to represent six different "cases" and to exhibit the behaviour expected of the six inadmissible personalities selected (e.g., someone who was criminally inadmissible, someone who intended to work but did not hold a work permit, someone who intended to abuse the health system, etc.). Extensive work was put into making the cases as close to reality as possible. The actors presented themselves at border points, and were referred to EIC by Customs officers who had been

briefed about the study. The research project tracked the number of occasions where someone got through (they should all have been sent back to their originating point) as well as the details of the process to which the actors were submitted. The results of the study indicated that improvements were required in the Customs referral process. Although the sample size was small, the study provided also a quantitative estimate of the performance of secondary examinations. Coupled with the results of the first study, an overall performance rate could be calculated as well as an overall compliance rate. Of course, these data could be extrapolated only at monitored points of entry.

Other studies with similar objectives have been undertaken in "blitzes", where a consultant interviews everyone who comes through Customs at a particular point for a given period of time to determine what may have been missed by Customs officers.

An additional mechanism meant to strengthen the quality of decisions made by Customs officers with respect to who should be referred to EIC or not, is the ongoing provision of feedback at each Port of Entry between Immigration and Customs officials. Feedback is provided to Customs on all cases that were referred with respect to the appropriateness of the referral.

Research and Reports: Immigration regulations, Port of Entry processing; Section 20 reports - Port of Entry Chapter PE-9

3.6 Revenue Canada Customs

Program description[1]: The Commercial Program ensures that all goods arriving into Canada by air, land, and marine are admissible. Some 80% come from the U.S., and 60% arrive by highway.

1 Key informant: Caroline Doyle, Commercial Compliance Measurement, Compliance Management Division, Operational Policy and Coordination Directorate, Customs and Trade Administration Branch

Background. Under the Customs Act, the Department administers legislation on behalf of other government departments (for example WAPPRIITA for Environment Canada, Immigration regulations for Immigration Canada). Their key job is to determine the admissibility to Canada of people, goods and conveyances. They began developing compliance measurement first in the 1980's in the Travellers Program. Systematic sampling was used to measure compliance rates of returning residents to Canada — every fifth traveller was selected and sent to Customs secondary examination. This system was pretty well entrenched by 1986 and used by Treasury Board as an example to other departments. By 1994, they decided to do the same thing with the commercial program but, with declining resources, had to modify their approach.

Definition of compliance. Compliance means that the goods are admissible — that they meet all the requirements to be admitted into Canada for consumption here (goods in transit are not covered by this program).

Regulated population. The regulated population is finite, but huge (numbering in the millions). It includes anyone bringing goods into Canada for consumption here. This program does not deal with illegal activity (contraband, chiefly tobacco, alcohol and drugs, is dealt with by another program, and has quite a different approach using intelligence, etc.). Members of the regulated population have to have business numbers, be registered for GST, pay customs duties, and through these mechanisms are a known quantity. Non-compliance with respect to commercial transportation is basically dealing with people who unwittingly make mistakes. In any event and in the greater scheme of things, the amount of illegal activity is considered to be low.

Sampling strategy. Since 80% of goods come from the U.S., and 60 % come by highway, the initial focus was on highway border locations. The sampling unit is commercial vehicles. Thirteen border locations were selected that accounted for 80% of the commercial volume. They built on the data from the travellers program, beginning with an assumption of 8% non-compliance, with a confidence level of 95% plus or minus 3%. The estimate of non-compliance, based on experience, has been decreased to

6%. A sampling methodology was designed using a random sample. At each of the 13 main ports of entry, 203 commercial vehicles were examined three times per year. With cutbacks, next year the plan is to draw back to once a year, but still provide national coverage even though 75% of all business goes into Southern Ontario.

A statistician from Statistics Canada was brought into the project and made some changes to the sampling methodology. It was refined to reflect more accurately the population and universe of commercial transporters. The statistician reviewed data collected to date, visited a number of ports in Canada and suggested some changes to the sampling methodology (e.g., drop "empties" since any goods would be the possession of the trucker, and not deemed commercial, and "bulkloads" since they did not have the physical capability of examining them).

Sampling began on highways in 1995, and in 1997 air and marine inspections began. The sampling strategy changed for marine as it was not possible to examine a whole container ship. The universe in this case is the release package — those goods released from customs control.

There is a fairly strong sense among staff that the strategy is mathematically defensible and there is a high comfort level in extrapolating the 6% non-compliance statistic obtained through sampling to the population as a whole in the highway mode. The confidence level is less with air and marine simply because the measurement system is so new. The estimate is that it takes a minimum of three years and preferably five to have statistically valid data.

Data collection methods. Information is gathered and reported locally during the course of the examination. The examination methodology used was copied from the American system which emphasizes the importance of standard practices in order to make sure that the same things are being measured at each site. Six inspectors cover the whole country to ensure that the sample is drawn randomly and equivalently from place to place, that every investigation is done exactly same way and that information is captured in a consistent fashion. (For example, when examining a truck all 400 boxes would be removed, every 8th box would be opened and 30 of

these would be piece counted with no variations in the process site by site).

Risk and non-compliance. The system is just now beginning to develop risk criteria, to focus examination efforts. The hope is that as they are developed, sampling can become more stratified, increasing in accuracy the universe examined.

Part of the complication of developing risk criteria is that this information has to be closely linked with balance of trade data and trade agreements.

Reporting. Aside from acknowledging the deterrent effect associated with examination, the use made of the information gathered in measuring compliance is multiple.

Reporting is done at many levels. Information reported to management is more like "an opinion poll" (in the words of the key informant). Reports can be broken down by mode of transportation, different release forms or "service options" (e.g., filling in the customs form on arrival of the shipment, or — for frequent importers — by pre-arrangement, etc.), country of origin, types of discrepancies, etc. Detailed information at the micro level would go to each local port in order to build location-specific profiles on types of non-compliance. Sometimes information is shared with American counterparts in specific regions, but there are concerns about privacy issues.

An important use of the information gathered for compliance measurement is improvement in client service. As program staff articulate it, "We make things so complicated that it becomes difficult for people to comply. [In measuring compliance] we find that there are things we can tell people that will make it easier to comply." So information is used more for educational programs, for importers, brokers, etc., than for performance reporting. A lot of the information gathered is used for targeting specific client groups, to help them comply. For example the system was picking up that there were more administrative errors with release packages (which in turn slows down the release of goods) during the summer months. Program personnel figured out that this was because the paperwork was being done

by summer students who were not properly trained. By bringing this information to the attention of the client community, they were able to help the members of the regulated community become compliant.

The data collected allows the program to focus on problem areas, for instance one service option over another. Once the pattern is documented, it goes back to the program staff for interpretation and action.

Another critical use of the information, in collaboration with Statistics Canada and Industry Canada is building the portrait of Canada's balance of trade. Information on imports and exports obtained by Customs is key to this. Balance of trade information in turn feeds into a number of statistical and trade initiatives such as Team Canada. One of the challenges posed for the Commercial Program is to get shippers to report very precisely what is coming in whether or not they have to pay duty. Since the tariff classification process is very complicated, there is a temptation among importers to just use a formula they know "works". It is hard to sell them on the importance of accuracy of information for making Canada a more competitive on the global marketplace. Because of the use made by Industry Canada of data collected, officials from this department they sit down with Customs from time to time to review methodology and information sought.

The understanding that compliance has to go hand in hand with client service and client education has brought both these functions together in one division in Revenue Canada Customs.

3.7 Canadian Food Inspection Agency

Background[1]. Although food inspection is now handled by the Canadian Food Inspection Agency, the compliance measurement process has not changed substantially since the days when it was handled by Agriculture and Agrifood Canada. It will gradually evolve in response to both resource

[1] Key informant: Dr. Graham Clarke, Canadian Food Inspection Agency

constraints and attempts to make the industry more self-regulating. Compliance measurement practices vary considerably from one commodity to another, depending on the degree to which the industry is self-regulating.

Program goal of Meat Inspection. There is a public health aspect and an economic aspect to compliance measurement with respect to meat processing. With respect to the first, the goal is to ensure that meat that is not fit for human consumption does not get into the food chain; with respect to the latter, the goal is to ensure that the meat inspection process meets with approval from prospective buyers in other countries to secure our international trade in meat products. Because the meat industry is export-oriented, the latter goal is the most important focus for the system. There is an assumption that if the meat inspection process fulfills the requirements of our trading partners, the safety of the product will be a given. This means that the standards that must be met are those imposed by our trading partners, over and above Canadian set regulations and the program will gradually evolve in alignment with these partners.

Regulated population. The population is known and stable, consisting of 600 federally registered slaughter houses and meat processing plants.

Methodology. Inspections and audits are the main tools for compliance measurement.

With respect to inspections, there is a government certified inspector present at all times in every slaughter house. In meat processing plants, where the industry has its own quality control systems, the role of the inspector is more to monitor the quality control program. The computerized inspection program, Hazard Analysis Critical Control Point, guides the procedures for inspection and is used by each inspector in documenting findings. It is basically a quality assurance program covering everything from rodent control to plant cleanliness. There used to be a system in place where reports on every plant were filed in Ottawa every month and used to do a compliance rating, but the emphasis now is pushing each plant to develop and fulfill its own quality control system, rather than gathering the information centrally.

With respect to audits, there is a national audit team which conducts 120 audits per year on-site in plants. The national audit team produces a monthly supervisory report, reporting on all infractions and actions taken. In many cases, the line between audits and inspections is not very clear.

The response to non-compliance is to apply economic pressure — either detaining or destroying products, or shutting down operations. The agency is working with the industry to try and strengthen quality control processes in order to decrease the inspection and audit load for government. The Agency's objective is to see a strong industry led quality control system, with the government monitoring the system. The industry itself would be responsible for setting control standards, keeping records and ensuring standards are met. There will always be some level of government oversight in order to assure trading partners of the integrity of the system.

Sampling strategy. In slaughter houses, all carcasses are inspected. In meat processing plants, the computerized inspection program assigns tasks to inspectors each day to ensure that they don't develop a routine which overlooks some aspects.

3.8 Human Resources Development of Canada

Wong and Roy (1997) describe the approach used by the Human Resources Development of Canada (HRDC) in measuring noncompliance with the Unemployment Insurance program:

> "A national random sample of UI claimants was selected from the active claimload and was referred to Investigation and Control Officers for in-depth enhanced ionvestigations. Results of the investigations were reported, along with details of the specific control and investigation activities, for analysis." (32)

3.9 Royal Canadian Mounted Police

The Royal Canadian Mounted Police (RCMP) deals with crime and illegal activity.[1] Hence, by definition, its focus is on non-compliance.

There has never been, and there still isn't, a particular interest in measuring compliance, within the RCMP. Although it is recognized that compliance is the goal, the organisational culture is such that it is believed that non-compliance will always exist and that it is the RCMP's role to track down the most significant non-compliance and to redress it.

In the best of cases, the RCMP may know about the demand side of the criminal equation and it may be possible to infer to the supply side: it is possible to estimate it through public reporting and through price curves (assuming a constant demand, prices are partly a function of supply). For the RCMP, the most relevant compliance data may be the victimization figures produced by the Canadian Centre for Justice Statistics and others.

In sum, the RCMP does not have solutions to offer to the measurement of non-compliance in the area of environmental regulation.

3.10 New York State Department of Environmental Conservation

This excerpt from Caito (1997) provides indications of the approach used by the New York State Department of Environmental Conservation.

> "Recognizing the limitations of the data, the Department is now collecting several additional categories of information to provide us with an "index" of compliance indicators that will help link our enforcement efforts to environmental quality objectives. This index

[1] Key informant: Dr. Barry Leighton, Review Branch, RCMP

now tracks the following seven items for each environmental media: 1) inspections; 2) warning letters; 3) notices of violation; 4) permit compliance schedules; 5) permits/modifications issued; 6) thank you letters (no violation after inspection); and 7) enforcement referrals (to attorneys).

Using statistics compiled for each of these categories, along with traditional indicators, the Department evaluates the number of violations detected per inspection on a programmatic or media specific basis. Thus, if the trend is downward over time (meaning less violations detected), this may indicate that our enforcement program for that media is successful.

In addition, based upon referrals to enforcement attorneys and subsequent enforcement resolutions, we are able to calculate, an "enforcement response ratio." This ratio measures the number of media violations addressed by category of enforcement response. Enforcement responses can be categorized in any number of ways. For example: Serious — order on consent, Medium — short form consent order, Marginal — warning letter. If an evaluation of the enforcement response ratios indicate that violations are increasingly resolved through use of marginal enforcement responses, with fewer serious enforcement responses, we may infer the enforcement program is making progress in fostering compliance in that particular media."

3.11 Excerpts from Canadian Federal Departments' 1997 Performance Reports

Since 1997, federal departments and agencies table a report on their performance over the previous twelve months. These new reports are described as follows:

> "[...] individual Performance Reports provide information on results actually obtained in serving Canadians, and on the cost of serving them. These reports present information on past performance. They will help parliamentarians assess departmental plans and priorities for upcoming fiscal years. Providing separate reports on performance increases the visibility of this information, encourages reporting of results, and improves accountability. Linking these to the President's

annual report, *Getting Government Right: Improving Results Measurement and Accountability*, creates a single window for accountability information, both across government and within departments. This kind of information is particularly valuable, too, in a results-oriented management environment - for making decisions, improving services to clients, and ensuring that the right kinds of programs are being delivered." (http://www.tbs-sct.gc.ca/tb/irpp/irppe.html#dep)

These reports are all cited in the attached bibliography and they are available at http://www.tbs-sct.gc.ca/rma/dpr/96-97/9697dpre.html.

The following are quotes from various Federal departments' 1997 Performance Reports.

Atomic Energy Control Board of Canada

"The Directorate of Reactor Regulation is responsible for all regulatory aspects necessary to protect workers, the public and the environment against the risks associated with nuclear reactors, heavy water plants and research establishments. Regulation involves the evaluation of applications for licences against safety standards and requirements set by the AECB, the issuance of licences, the surveillance of licensees' operations to ensure compliance with regulations, and the review of the training and the authorization of reactor operators."	*Known population*
"Internal Audit is planning a study of Compliance Inspection, Enforcement and Follow-up Review"	*Known population*

Office of the Chief Electoral Officer

"To ensure fairness and transparency in administering the electoral process for the by-elections, the agency [...] monitored compliance with and enforcement of the provisions of the Act, including the investigation of 14 complaints by the Commissioner of Elections Canada, 12 of which have been closed without prosecution, while 2 remain open."	*Based on complaints*

Canadian Human Rights Commission

"The Anti-Discrimination Programs Branch is responsible for investigating and conciliating all complaints filed with the Commission, and for monitoring employment equity settlements. The Branch presents cases to the Commission, trains staff involved in compliance activities, and establishes performance standards and operational policies."	*Based on complaints*
"The Employment Equity Branch conducts employment equity audits with employers in the private and public sectors to assess their compliance with the requirements of the Employment Equity Act."	*Known population*
"Result: Compliance by federally regulated employers. Indicator: Improved representation of minority groups with the new Employment Equity Act in the workplace"	*Known population*
"A newly-formed Employment Equity Branch completed an extensive round of consultations with employers, unions, advocacy groups, federal departments and interested individuals across the country to discuss a compliance audit framework which would guide the implementation of the Commission's new mandate under the Employment Equity Act. Under this legislation, the Commission must conduct compliance audits of employment equity programs of some 425 federally regulated employers, as well as federal departments and agencies which are legislated for the first time."	*Known population*

Department of Finance Canada

"The Technical Committee on Business Taxation, established in the 1996 budget, continued its work throughout 1996-97. The Committee's mandate is to consider ways in which Canada's business taxation system could contribute more to the creation of jobs and economic growth, could be simplified to facilitate compliance and administration, and could be made fairer to ensure that all businesses share the costs of providing government services. The Committee's report is expected to be released early in 1998"	*Not measurement*
"The government also introduced over 100 measures to streamline and simplify Canada's sales tax. These can be categorized as follows [... and] clarifications and measures to ease compliance."	*Not measurement*

Indian and Northern Affairs Canada and Canadian Polar Commission

"Objective: Provide First Nations, Northerners and Other Canadians with Improved Conditions on Reserve. Demonstration: implementation of a strategy for managing compliance with the natural resource provisions of the Indian Act and the Indian Timber and Mining Regulations. Achievement: developed guidelines for dealing with unauthorized cutting and removal of timber and the removal of minerals. "	
"Monitoring and Compliance Mechanisms for Leases and Permits: In support of advance devolution, WINLANDS, a software package for monitoring land transactions on reserves, including leases and permits, is being implemented in most regions, with completion planned for the 1997-98 fiscal year. One British Columbia First Nation also has access to WINLANDS.	*Known population*
"The second prong of the sector plan is compliance. DIAND is responsible for ensuring compliance with the Indian Act and the regulations made thereunder. The required level of compliance is being addressed through the development of a National Framework. At the same time, work will be done with First Nations to address resource management issues."	

"Review of the Social Assistance (SA) Methodology for Compliance: This review provided senior management with an assessment of the adequacy of monitoring and the accountability framework related to the program. It also identified ways and means for a more cost-effective approach to program reviews and monitoring of social assistance activities and identified practices that could be used to ensure program reviews are an effective management tool to reduce risks in areas of eligibility, leakage and potential fraud. The review covered headquarters and all regions (except NWT). As a result of the review, the department will ensure that all forms of funding agreements for delivering the program have an appropriate compliance and program review component, that program recipient data is accurate prior to entering into funding agreements and that the year-end reporting requirements include appropriate program management data."	*Unknown population*

National Energy Board

"Result: effective public and environmental safety regulation of pipeline facilities and the development of hydrocarbons on Frontier lands north of the 60th parallel; indicators: the rate of incidents on pipeline facilities regulated by the Board; and the compliance rate by the companies we regulate."	*Known population*
"The Board conducts regular on-site safety inspections of pipeline systems to ensure compliance with regulatory requirements, approves specifications and procedures and the terms and conditions set out in certificates of approval, and to ensure safety of company personnel and the public."	*Known population*

Canadian Environmental Assessment Agency

"Result: high quality federal environmental assessments that contribute to informed decision making in support of sustainable development; indicator (among others): Federal authorities that have a greater understanding of, and are in compliance with, the requirements of the Canadian Environmental Assessment Act. [Note: no compliance measurement proposed, only a list of activities]"	*Known population*

Health Canada

"Health Canada has undertaken a major review of more than 1,200 drug-related operations that will fall under the new Establishment Licensing Regulations, in order to assess their compliance with Good Manufacturing Practices (GMPs) Regulations." *Known population*

"Tobacco: The enforcement program was audited in 1996-97. The report is still being reviewed, but a major finding is that the program is working: from 1995 to 1996, non-compliance among retailers dropped from 50 percent to 40 percent." *Known population*

Offices of the Information and Privacy Commissioners

"The Privacy Act gives the Commissioner the power (and the discretion) to investigate (audit) federal government compliance with the Act's fair information code. Given the near impossibility of systemic auditing, the Office shifted its emphasis to examining specific departmental privacy issues and others that are government-wide." *Known population*

Canadian Radio-television and Telecommunications Commission

"To make these assessments in broadcasting, some of the mechanisms the CRTC uses are: analysis of program information and of annually submitted financial data, to ensure compliance with Canadian content and other requirements [...]." *Known population*

Agriculture and Agrifood Canada

"AAFC's Inspection and Regulation mandate is: to monitor and enforce industry compliance with government food safety and quality standards and prevent economic fraud, to prevent, control, or eliminate animal and plant diseases and pests of economic or human health significance; and to regulate plant products." *Unknown population*

"Canada's excellent domestic and international reputation for a safe and high quality food supply and effective control of animal and plant diseases ensures that Canadians enjoy the protection of one of the best food inspection and quarantine systems in the world as well as providing many jobs and valuable exports for Canada. The following graphs provide comparative compliance rates for both establishments and products (Actual Percentage of Standards Met 1994 - 1997, Actual Percentage of Grading Accuracy 1994 - 1997)"

"Result: monitoring compliance by our trading partners of commitments on market access, domestic support agricultural products and export subsidies; indicator: used the WTO dispute settlement mechanism to prevent and resolve disputes with trading partners on" *International population*

Citizenship and Immigration Canada

"Audit of Missions Abroad: In 1996/97 on-site audits were conducted of the immigration programs in Port-au-Prince, Guatemala, Moscow, Nairobi and Beijing, completing a two-year cycle of management audits of selected missions abroad. The audits were designed to review and assess management principles, practices and processes, including the degree of compliance with legislation, policies and procedures associated with the delivery of the immigration program. The reviews indicated that the program is being delivered effectively. Strengths were exhibited in planning and in initiatives to enhance service delivery and risk management practices. However, weaknesses were identified in the control systems for cost recovery and forms control. As a result of the audit observations, improved controls in these areas were identified as delivery priorities and are currently being implemented." *Internal compliance*

Commissioner of Official Languages

"As protector of language rights, the Commissioner surveys compliance with the Official Languages Act and its spirit and makes sure that the government fulfils its commitments regarding the vitality and development of the official language minority communities. Accordingly, the Commissioner has devoted sustained efforts towards ensuring that these communities obtain the governance of their own school systems, as provided by the Charter of Rights and Freedoms."	*Known population*
"In addition, the regional offices evaluate the extent to which federal institutions in the regions promote the spirit as well as the letter of the Act and their compliance with their legal obligations to provide service to the public in both official languages where there exists a significant demand."	*Known population*

Correctional Service of Canada

"In August 1996, a Policy Review Task Force was created to explore the issue of non-compliance and to provide clear, concise and consistent policy direction in keeping with the law. The Task Force found that the Service's existing policy framework was generally sound, but made recommendations to ensure greater clarity of various components. These recommendations were approved in November 1996. The most significant change to the policy framework was to create a new instrument which provides staff with specific direction on how the law and policy is to be applied in day-to-day operations. This instrument will lead to the elimination of a wide range of existing documents such as manuals, codes, guidelines and standards which had, over time, become unclear."	*Internal compliance*
"To develop a revised policy framework that will: • clearly identify accountabilities; • define the criteria for assessing compliance; • state the relationship between policy and legal requirements; • establish improved processes for policy development and consultation; • make optimum use of new technology in communicating policy and providing training to staff."	*Internal compliance*

Canadian Transportation Agency

"Rail complaints and audit services: The Agency conducted 55 audits to ensure compliance with the law and to analyse railway company accounts. The results confirmed that information used to calculate freight rates and for other regulatory functions was correct." *Known population*

Human Resource Development Canada

"LAOs also conduct reactive activities such as responses to complaints, refusals to work and accident investigations. The number of cases of non-compliance found through proactive inspections and reactive complaint responses are measures of the performance of these activities under Parts II and III." *Known population*

"Our Workplace Equity Officers (WEOs) promote and monitor compliance of the 341 private-sector employers covered by the Employment Equity Act and the 762 employers covered by the Federal Contractors Program. During 1996-97, WEOs also began to assume responsibility for equal pay provisions of Part III of the Canada Labour Code from the LAOs. In 1996-97, we visited 85 employers to monitor their compliance with the equal pay provisions of Part III. We continued monitoring of 915 others, and 78% of these employers have acted to ensure compliance." *Known population*

Revenue Canada

"Revenue Canada has set itself the following objectives: *Statement of objective*

- to ensure the assessment and collection and appropriate refund of all taxes, duties and other relevant charges and levies in a fair and timely manner;
- enhance the competitiveness of Canadian business through administration of a wide variety of trade policy instruments and the facilitation of international commerce and tourism;
- to ensure compliance with legislation; maintain sovereignty at the border, and protect Canadian business, individuals and society generally from inadmissible or dangerous goods and people; and
- support the social and economic programs and goals of the Government."

"Result: administration of the taxation regime for the Federal Government and certain provinces and territories by assessing and collecting taxes, duties, and other levies and payments and delivering a number of social and economic benefits in a fair and timely manner; indicator: [...] trends in compliance in high-risk areas within the small and medium enterprise sectors."	*Known population*
"Result: enforcement of Canadian laws and sovereignty at the border and support of Canadian industrial competitiveness and economic policies; indicator: compliance rate for travellers entering Canada"	*Defined as a known population*
"Implications of Electronic Commerce for Compliance: The rapid growth of electronic commerce in the economy had a significant impact on the Department's ability to verify and enforce compliance. As a result, the Department worked in close cooperation with the Department of Finance and other tax jurisdictions to address the issue. The Department increased its expertise in audit and investigation techniques related to automated systems and electronic information, and established an Advisory Committee on Electronic Commerce with leading experts from the private sector, academic community and government."	*Unknown population, verify*
"Implementing a Compliance Strategy: The Department continued to implement and refine its comprehensive compliance strategy to achieve and maintain an acceptable level of voluntary compliance. In March 1997 it released a report on compliance entitled "Compliance: From Vision to Strategy" to outline its approach, the results achieved and new challenges being addressed. The specific strategies focused on identifying the factors influencing compliance and non-compliance to ensure the best possible results."	*Improving compliance*
"Compliance rate: Travellers, by any mode, who comply with the laws administered by Customs Border Services. This measurement is a result of statistical sampling carried out systematically at points of entry across Canada."	*Defined as a known population*

Solicitor General Canada

"The office of the Inspector General of CSIS is established by the Canadian Security Intelligence Service Act. The Inspector General has right of access to CSIS information and serves as the Solicitor General's internal auditor for CSIS operational activities. The office of the Inspector General regularly monitors the Service's compliance with its operational policies; reviews CSIS operational activities for compliance with law, other authorities, controls and standards governing the performance of these operational activities; and provides classified reports in support of the Inspector General's advice and a statutorily required Certificate to the Minister regarding these matters. Special reviews may also be conducted at the direction of the Minister, Security Intelligence Review Committee (SIRC), or on the Inspector General's own initiative."

Internal compliance

Chapter 4

METHODOLOGICAL ISSUES

4.1 Issues

The area of compliance measurement raises several methodological issues.

- ***Population Definition***. How is the regulated population defined? Various regulatory provisions aim at various populations: for example, producers in a particular industry, individuals carrying out a certain activity, all members of society. A clear definition of the regulated population is essential to the assessment of the sampling needs and the development of solid samples.

- ***Sampling Frames***. Sampling frames are the lists which are used to select the members of the regulated population which will compose the sample. Three situations can occur:

- a complete list of the population may exist, such as that of pulp and paper companies; in this case, the only issue is that of the quality of that list;

- a complete list may not exist but may be a subset of another list, such as a list of international travellers which could be deduced from a list of the entire population through filtering;

- a list of members of the regulated population may not exist but a list of groups of members (clusters) may be available; for example, there may be no list of hunters but it may be possible to build a list of hunting clubs; the selection of groups as a first step to the selection of members of the groups is called cluster sampling.

Sampling frames are essential to the selection of samples of members of the regulated community. Their quality, exactitude and completeness must be assessed and counter-measures must be considered to address weaknesses. Of course, sampling frames are necessary only in the case of compliance measurement which uses direct measurement at the level of the members of the regulated community; compliance measurement which uses an indirect approach such as the joint analysis of consumption, production, imports and exports does not require this type of sampling frame.

- ***Sampling Strategy and Statistical Inference***. The requirement to sample stems from the impossibility of enumerating every member of a population. Where the population is limited in numbers (e.g., pulp and paper processing sites), a sample may not be required.

  For the purposes of measuring compliance, random samples are a necessity; non-random samples do not provide the statistical inference power expected of such measurements. While there is a variety possible sampling strategies within the random sample category, two really stand out for measuring compliance : simple random sampling which requires a list of members of the regulated community and cluster sampling which identifies members of the

regulated community within clusters of members which are initially sampled. The former strategy requires a list but produces more precise estimates for a given sample size.

Sampling raises another issue: sampling is done within a population of members of a regulated community but it is also done, if only implicitly, within the "population" of time periods available. A good sample should ensure that observations are done at all relevant moments of the observation period or, at least, at randomly chosen moments.

- ***Operational Definition of Compliance***. Measuring compliance means that the concept of compliance must first be defined operationally. One cannot observe compliance without a list of behaviours or states which are compliant with the regulation. The complexity of existing regulations will mean that only a portion of them will be used in creating the operational definitions of compliance. The most significant portions should be selected, not only the most practical or the most easily assessed.

- ***Level of Measurement***. Most of the previous discussion takes for granted that measurement will take place at the level of the individual regulated community member (e.g., a company, a site, a person). It is also possible to plan some measurement at an aggregate level such as towns, hunting clubs, etc. This might apply more to the measurement of environmental states (e.g., the level of pollutants in rivers) than to the measurement of compliance, however.

- ***Methods of Data Collection***. Again, there is a variety of methods available to collect information on compliance. A Transport Canada (1990) report suggested several relevant ones: direct observations during inspections or audits, automated monitoring, manual or automated reporting managed by the member of the regulated population, quality control programs, voluntarily-provided samples, monitoring by regulated community associations, third-party monitoring, etc. This list mixes who does the observation with how

the observation is done, yet it contains several useful ideas. It is most likely that a compliance measurement plan would have to use several methods of data collection and several sources of information to efficiently collect the required information.

4.2 Options

Environment Canada offers a very complex regulatory environment: some 30 regulations; several Acts of Parliament; in total, some 500 to 600 regulatory provisions. Each provision could be subjected to compliance measurement but this would obviously be a gigantic and costly endeavour which would produce non-priorized, ultimately useless, information.

Any compliance measurement plan will need to first identify the key provisions which require measurement. Priority should be given to high risk areas as well as areas which will lead to meaningful decisions and communications. Care will have to be exercised in clearly establishing that a high level of compliance does not necessarily mean a high level of environmental protection.

This section analyses the strengths and weaknesses of three options for measuring regulatory compliance.

a. Non random, sample-based inspection results ratios

Most compliance assurance programs involve the inspection of regulated sites. Because of resource constraints, most programs select sites for inspection on the basis of the probability of discovering significant infractions. If the site targeting procedure is at all effective, the sites inspected are therefore representative of those most likely to present infractions. Basing compliance measurement on the ratio of such sites which were found not to comply with regulations would over-estimate non-compliance.

Because of the deficiencies of this approach, Fisheries and Oceans Canada had to explain an increase in non-compliance in aboriginal fisheries in the Fraser River Division in 1996 in the following way: "due to high profile and better targeted enforcement program in the Mid-Fraser area where increased numbers of persons were charged in 1996" (from a slide presentation). Similarly, the same department, dealing with recreational salmon fishing, indicated that "It should also be noted that given the fact that recreational fishers tend to be concentrated in high numbers, in specific, readily accessible areas, it is easier to detect illegal fishing activities hence the high numbers of charges".

Hence, even without change in actual non-compliance, such a ratio could change due to increased successful monitoring efforts (e.g., more charges laid) or due to increased unsuccessful monitoring efforts (e.g., more inspections without more results).

Thus, this type of ratio does not pass the reliability and validity tests.

b. Random, sample-based inspection results ratios

One way to correct the problems associated with non-random sampling is to force the randomness of the inspection schedule. *Obviously, this would not be an effective method to select inspection sites for the purposes of enforcing regulations and legislations*. However, it is important to remember that such is not the objective of the proposed approach. Random inspections aim at measuring compliance, not at participating directly in the enforcement program (albeit compliance measurement is part and parcel of a complete enforcement program since it provides feedback information on enforcement effectiveness). *Therefore, in this scenario, only a fraction of the inspection resources would be attributed to randomly sampled inspection sites*.

The compliance measurement program would be based on a random sample of the members of the regulated community. The sampling requirements limit this approach to situations where the population is enumerated or where it is not enumerated but known. Elusive populations are excluded from this approach. Exhibit 4.1 offers a few sample size

estimates for the measurement of various compliance levels among populations of different sizes. Sample size requirements are lighter for smaller populations and for more compliant populations. All sample size requirements were computed assuming a margin of error of five percentage points which means, for example, that a measured compliance level of 10% would have to be interpreted within a range of 5% to 15%.

EXHIBIT 4.1 • Sample Size Requirements

Compliance level		Population size		
		300	1,000	10,000,000
30%	[25-35]	156	245	324
20%	[15-25]	136	198	247
10%	[5-15]	95	122	139

Note: all of theses sample size estimates provide a ± 5 percentage point margin of error, at a 95% confidence level.

Another requirement of this approach is the development of a systematic observation plan. Inspectors or observers cannot be simply left to themselves in the selection of the observations to make and the aspects of compliance to verify. A common observation schedule and measurement tool must be developed and adhered to systematically by every observer.

The main weakness of this approach is its cost. In areas of high compliance levels, the vast majority of sampled cases would be inspected and monitored without uncovering non-compliance events. This should be seen as a positive situation since it would confirm the authority of the regulations tested.

c. Dealing with illicit activities

The most difficult aspect of this study topic is the particular area of non-compliance which results in illicit or criminal activities. Typically, this would correspond to elusive populations and intentional behaviour (see Exhibit 2.1), a combination which rhymes with a will not to be identified. Random sampling and systematic observations are inadequate tools to deal with this situation. None of the key informants contacted in this study

offered conclusive methods to estimate the level of non-compliance in this segment.[1]

Intelligence or under-cover strategies are useful in pursuing the identification of criminals and enforcing regulations, but they are not adequate tools for strict measurement purposes.

Indirect measurement is a possibility in some instances. For example, it is possible to estimate the quantity of smuggled cigarettes by subtracting official trade (measured through official declarations filed by tobacco companies) from the total market size (estimated from tobacco use studies). This is relatively easy because there is reliable accounting of licit production and because the smoking behaviour is legal as well. The situation is very different for hard drugs where trade and consumption are illegal.

There is no one best way to approach the measurement of the size of non-compliance in the area of illicit activities.

[1] Strictly speaking, the entire ellicit segment is non-compliant, by definition. The issue is not to measure the level of non-compliance within the elicit segment but to measure the segment size.

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