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A Comparison of U.S. and Japanese Environmental Laws Governing Emissions from Major Industrial Facilities

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I. INTRODUCTION

This Article offers a general and practical comparison of the major environmental laws in the United States and Japan. Specifically, this Article reviews both countries' national environmental policies and their laws which regulate air, water, and hazardous chemicals. It also compares the relationship between industry and government concerning the control of pollution in each country. The authors derive much of the substance of this Article from their numerous visits to Japan and from their current involvement with permit process for industrial plants in the United States.

A. Governmental Agencies in Japan

Before 1970, the Japanese government lacked a systematic, centralized pollution control administration. Jurisdiction over environmental problems was randomly distributed among various ministries and advisory councils.[1] Organizations such as the Ministry of International Trade and Industry (MITI), the Ministry of Health and Welfare, and the Ministry of Agriculture and Forestry, along with many others, had individual responsibility for specific aspects of pollution control.

Public criticism of environmental problems was on the rise in the 1960s, and by 1967, the Japanese government was under pressure to establish a new, independent environmental agency which would systematically administer pollution control.[2] Internal criticism of the existing structure in Japan further increased in 1970 when the United States established the Environmental Protection Agency (EPA) and other countries established similar independent governmental agencies.[3] Because of this internal and external pressure, the Japanese government passed the Environmental Agency Establishment Law on May 24, 1971,[4] and the Environmental Agency came into being on July 1, 1971.[5]

The Environment Agency, headed by a director/general appointed to the cabinet with the rank of Minister of State, is comprised of four bureaus: (1) Planning and Coordina-

1. JULIAN GRESSER ET AL., ENVIRONMENTAL LAW IN JAPAN 26 (1981).
2. *Id.*
3. *Id.*
4. The Environment Agency Organization Law, Law No. 88 (1971); *see* Roger E. Lutz, *The Laws of Environmental Management: A Comparative Study*, 24 AM. J. COMP. L. 447, 454 (1976).
5. ENVIRONMENTAL AGENCY, GOVERNMENT OF JAPAN, QUALITY OF THE ENVIRONMENT IN JAPAN 247 (1987) [hereinafter ENVIRONMENTAL AGENCY].

tion, (2) Nature Conservation, (3) Air Quality, and (4) Water Quality.[6] The Planning and Coordination Bureau plans and implements basic policies covering environmental protection and coordinates various measures undertaken by other governmental agencies to protect the environment.[7] The Nature Conservation Bureau drafts and promotes policies relating to the conservation of nature.[8] The Air Quality Bureau establishes environmental quality standards and enforces various pollution control laws.[9] Finally, the Water Quality Bureau promulgates water quality standards, enforces these standards, and regulates water pollution.[10] In practice, the authors have observed that the overall organization of the Environment Agency of Japan is very similar to that of the EPA.

B. Environmental Pollution Control Policy in Japan

The Basic Law for Environmental Pollution Control (Basic Law) governs environmental policy in Japan.[11] The Basic Law establishes fundamental national principles and policies, defines the scope of pollution control, assigns responsibility for carrying out pollution control measures, and sets forth basic guidelines for regulations and administrative procedures.[12] On the whole, the Basic Law is a statement of policy which provides a framework for the Environmental Agency to follow in passing more specific laws for the seven types of pollution which the Basic Law covers.[13]

The Basic Law defines environmental pollution to include any situation where human health and the living environment are damaged by air pollution, water pollution, soil pollution, noise, vibration, land subsidence, or offensive odor.[14] The law also establishes general principles concerning the financial responsibility of national and local governments as well as private enterprise.[15] The Basic Law gives the national government the responsibility for establishing fundamental and comprehensive policies for environmental pollution control as part of its functions of protecting public health and conserving

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6. *Id.* at 248-49.
7. *Id.* at 250.
8. *Id.* at 251.
9. *Id.* at 252.
10. ENVIRONMENTAL AGENCY, *supra* note 5, at 253.
11. The Basic Law for Environmental Pollution Control, Law No. 132 (1967), *as amended by* Law No. 132 (1970), Law No. 88 (1971), Law No. 111 (1973) and Law No. 84 (1974) [hereinafter Basic Law]. INDUSTRIAL POLLUTION CONTROL ASSOCIATION OF JAPAN, ENVIRONMENTAL PROTECTION IN THE INDUSTRIAL SECTOR IN JAPAN, A SURVEY OF ACHIEVEMENT 158 (1983) [hereinafter IPCAJ].
12. IPCAJ, *supra* note 11, at 158. The Basic Law remained unchanged during 1993 since there was a no-confidence vote in mid-1993 for the existing government. *Id.* The Miyazawa Cabinet was defeated by a no-confidence vote and the Prime Minister dissolved the cabinet. *Id.* This prevented a new bill from being passed on June 18, 1993. *Id.* Therefore, for the balance of 1993, the existing "Pollution Control Measures Basic Laws" remain in effect. *Id.* In early 1993, the Director General of Japan Environmental Agency commissioned the Central Council for Environment Pollution Control to consider the improvement of National Effluent Standards and also to study soil contamination standards. *Id.* The Central Council is expected to submit its report by the end of 1993, and some changes in Japanese environmental law can be anticipated for 1994. *Id.*
13. *See supra* notes 6-12 and accompanying text.
14. ENVIRONMENTAL AGENCY, *supra* note 5, at 2 (citing Basic Law, art. 2).
15. *Id.* at 6 (citing Basic Law, arts. 22-24).

national resources.[16] Local governmental bodies,[17] on the other hand, execute these national policies and develop measures to meet special local needs, taking into account local, social, and physical conditions, although they may at times regulate pollution by administering a more stringent local standard.[18]

C. Federal Versus Prefectural and State Control

In Japan, local governments have the authority to take charge of the preservation and improvement of the environment in their jurisdiction; they can establish ordinances without infringing upon the laws or order of the national government. Every prefectural government is free to establish stringent regulations for matters belonging to its autonomy and its residents' rights to life, and each local government has in fact enacted an ordinance for environmental pollution control.[19] More specifically, the trend toward decentralization of pollution control in Japan has accelerated to the point where seven prefectures have passed ordinances establishing a comprehensive approach to environmental protection, and every prefecture has passed some type of pollution control ordinance.[20]

II. A COMPARISON OF U.S. AND JAPANESE AIR AND WATER POLLUTION LAW

A. Japanese Air Pollution Control Law

The purpose of Japan's Air Pollution Control Law is to protect public health and preserve the living environment from harm caused by air pollution. This goal is achieved through regulation of the emission of soot or particulate matter, smoke, dust, and motor vehicle exhaust.[21] The law requires that emission standards be set for each type of emission by the prescription of maximum permissible limits.[22] These limits are called Environmental Quality Standards (EQS).[23] In areas designated by a cabinet order, where attaining the applicable EQS will be difficult due to a high concentration of factories and industrial establishments, the law requires the governor of the prefecture containing the area to formulate a mass reduction plan for emissions, but allows standards below or at variance with the national EQS.[24] The practical consequence of the Air Pollution Control Law is that all major industrial areas and cities will be covered by mass reduction plans for air emissions.

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16. *Id.* at 2 (citing Basic Law, art. 4).

17. Japan has 46 prefectures which are analogous to the 50 states in the U.S. 6 DOING BUSINESS IN JAPAN § 10.01[4] (Zentaro Kitagawa ed., 1989) [hereinafter DOING BUSINESS]. Each prefectural government has a division specializing in environmental pollution administration, an environmental pollution protection center or an institute to research environmental pollution. *Id.*

18. ENVIRONMENTAL AGENCY, *supra* note 5, at 5 (citing Basic Law, art. 18).

19. DOING BUSINESS, *supra* note 17, §§ 10.01[5], 10.03[2][i].

20. MAINICHI DAILY NEWS, Sept. 15, 1977, at 5.

21. Air Pollution Control Law, Law No. 97, art. 1 (1968).

22. *Id.* arts. 1, 2.

23. *Id.*

24. *Id.* arts. 5-2, 5-3; communication with Koutoko Igarashi, General Manager, Environmental & Safety Department, Mitsubishi Materials Corp., in Tokyo, Japan (Aug. 15, 1990).

Any person who plans to establish a facility which will emit soot and smoke or discharge particulate matter must report the following information to the governor of the prefecture:

(1) His or her name, or the name of the firm, and the address;
(2) name and location of the plant or business establishment;
(3) kind of proposed emitting facility;
(4) structure of the proposed emitting facility;
(5) method of operation of the proposed emitting facility; and
(6) proposed method of disposal of soot and smoke or particulates.

The governor of the prefecture has the power to issue all the permits to begin construction and normally does so within a short period, approximately two months.[25] Thus, the central government has delegated the authority to issue permits to local governors.

Other enforcement regulations require that the following information be reported when a party intends to construct a new emission-emitting facility:

(1) Method of discharge;
(2) locations of discharge;
(3) outline of the facility's operating systems;
(4) discharge measuring points;
(5) emergency communications methods; and
(6) drawings of the facility and other documents.[26]

The information contained in these applications provides the government of the prefecture with knowledge of the exact location of the discharge, the instrumentation used, and the method of operation. This knowledge makes it easier to inspect and supervise the facility.

Once an emitting facility is operating, the governor of a prefecture may require the emitting facility to make specific reports to the governor. Further, the operator of the emitting facility may be required to allow inspection by representatives of the prefecture at any time without notice.[27] However, because of the trust which usually exists between the prefecture and the operation, an inspection without notice is rarely performed. If the governor finds that the emitting facility is failing to observe the established standards, the governor may either order the facility to conform to the standards within a specific time or order a temporary suspension of the facility's operations.[28] In addition to the required inspection and reporting, the governor of the prefecture must establish a monitoring system to survey the level of air pollution.[29]

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25. Air Pollution Control Law, arts. 1, 6, 18. Compare this time frame to the time required to obtain a permit in the U.S., which is anywhere from two to five years for federal and state permits.
26. Air Pollution Control Law, *supra* note 21, arts. 8, 10.
27. *Id.* art. 26.
28. *Id.* art. 18, para. 4.
29. *Id.* art. 22.

B. Japanese Water Pollution Control Law

Similar to its Air Pollution Control Law, Japan's Water Pollution Control Law is designed to prevent the pollution of water in public water areas. A public water area is defined to include rivers, lakes, harbors, and coastal seas, along with the water lines[30] connected to them. Under the Law, national effluent standards are set for substances which affect human health and the living environment.[31] A person who discharges effluent from factories or other industrial establishments must meet a reporting requirement similar to those applicable under the Air Pollution Control Law.

The Water Pollution Control Law requires persons who operate an emitting facility to report the following information to the prefecture in which the plant is located:

(1) Their names and addresses, and for corporations, the names of their representatives;
(2) name and address of the factory or establishment;
(3) type of facility;
(4) structure of the facility;
(5) manner of use of the facility; and
(6) method of treatment of polluted water or waste liquid to be discharged from the facility.[32]

Additionally, persons may have to report to the Prime Minister's office[33] other items provided for in an ordinance, such as the pollution level and the quantity of effluent to be discharged.[34]

By way of local control, the Water Pollution Control Law grants the governor of a prefecture the power to establish more stringent standards for preserving human health and the living environment if the national effluent standards are judged to be insufficient.[35] The Water Pollution Control Law also has a report and inspection article that requires emitting facilities to make specific reports and allow inspections upon the request of the local prefectural governor.[36] Further, the law gives the prefectural governor the power to order improvements to an emitting facility to reduce the level of any effluent. If a facility fails to meet an effluent standard, the governor may order either that the facility be temporarily shut down or that the discharge of effluent be stopped.[37] Finally, both local and national government agencies have monitoring programs to survey water

30. The water lines are the actual pipes and ditches that transport the liquid effluent into the public body of water.
31. Water Pollution Control Law, Law No. 138, art. 3 (1970); Air Pollution Control Law, *supra* note 21, ch. II, art. 3.
32. Water Pollution Control Law, *supra* note 31, art. 5.
33. *Id.*
34. *Id.* art. 3, para. 3.
35. *Id.*
36. *Id.* art. 22.
37. *Id.* art. 13.

quality.[38] Periodic government inspections, including sampling and assaying of the effluent, ensure that the facility is free of pollution.

C. Overview of the Japanese Permit Procedure for a New Emitting Facility

The Japanese national laws allow each prefecture to regulate the granting of new permits for the construction of new plants as well as the modification of existing emitting facilities.[39] An applicant must notify the Environmental Bureau of the proposed pollution-emitting facility and supply the Bureau with information about the products which the facility will produce.[40] The laws may also require the submission of additional information in the report.[41] The Environmental Bureau reviews the reports without the requirement of an assessment; the Bureau normally grants the application without delay and without any environmental impact statement or detailed studies.[42] Simultaneously, the applicant submits a permit application for the new facility to the Industries Bureau, which makes inspections at the plant site. An applicant applies to the Construction Bureau for building and development permits. Once the applicant obtains both permits and the Industries Bureau's approval, the applicant then can begin construction on the emitting facility.

D. Comparison of U.S. and Japanese Air and Water Pollution Control Laws

Japanese air and water pollution control laws tend to be supervised on a regional level. Although Japanese law mandates national EQS, it allows local prefectures to establish more stringent effluent and ambient air discharge standards in areas where the national standards are unlikely to attain the applicable EQS. Thus, most pollution standards in industrial areas will be controlled by the local prefecturals.

The Japanese permit procedure for new facilities, whether built by Japanese firms, joint ventures, or foreign firms, appears to require minimal effort. The operator of a new facility must submit to the local prefecture a report describing the facility. The report primarily informs and notifies the prefecture of the facility's existence and of the products that it will produce; however, the prefecture performs no assessment at the time of the report because it assumes that the facility will operate in compliance with the standards of the local prefecture. In Japan, after the facility is built and in operation, more regular monitoring of the facility's operations occurs, more reports from the emitting facility must be submitted, and more site inspections of the facility are performed by the local government than in the United States.[43]

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38. *Id.* arts. 15-16.

39. *See infra* Appendix A (discussing the procedure required for a Japanese facility to secure permits for construction and operation).

40. *See supra* notes 25, 32 and accompanying text.

41. *See supra* notes 26, 35-36 and accompanying text.

42. This swift action by the Environmental Bureau is in marked contrast to the environmental impact statements required for most major U.S. projects. *See* 40 C.F.R. §§ 1502.3, 1508.18(a) (1992).

43. DOING BUSINESS, *supra* note 17, §§ 10.02 [1][b], [2][b]. Mitsubishi Materials Corp. (MMC) obtained all the environmental permits necessary to build a new copper smelter at Naoshima, Japan, in 42 days during November and December of 1989. The applications included the monitoring, reporting, and

Another very important distinction between Japanese and American pollution law can be found in the respective relationships between government and industry. In Japan, government and industry jointly promote industrial development.[44] The federal and local governments try to be more helpful than coercive in their approach to regulation, and they tend to be flexible in working with industry.[45] In return, industry collaborates with government more often than it opposes governmental environmental regulations.[46] Further, various government ministries, such as the Ministry of Finance and the MITI, normally retire their top bureaucrats between the ages of fifty to fifty-five years. These retirees then provide a reservoir of potential board members and executives for large companies. In these executive positions, the former vice ministers maintain close relations with their former ministry subordinates, who were often their protégés. Their subordinates often move into the vacated government posts. The overall atmosphere between industry and the government in Japan is therefore one of partnership.[47] For a major project, a company works with the government and environmental groups to ensure that public opinion is favorable toward the project.[48]

This relationship is in contrast to the situation in the United States, where representatives of industry and government generally view each other as adversaries, rather than partners. Because of this relationship, industry will often oppose federal regulations and proceed with time-consuming and costly legal battles rather than moving forward with research and implementation of pollution technology.

A further difference between the two countries lies in the delegation of duties for the development and enforcement of environmental laws. The Japanese Environmental Agency drafts a master plan for the environmental protection policy. In preparation of the master plan, the Environmental Agency accepts opinions from the interested ministries and prefectures. MITI promotes the development of industry as well as comments on the master plan, with due regard to the actual condition of the nation and its pollution. However, prefectural governments put rules into practice within their sphere of jurisdiction instead of the central Environmental Agency. In practice, the prefectural government has been delegated the responsibility of handling the permit procedure at a local level for emitting facilities. This system makes matters much easier for new industry than the U.S. system, which is mainly regulated at the federal level.

Finally, with regard to the stringency of regulations, Japanese and U.S. effluent and ambient standards appear somewhat similar. However, the United States is slightly more

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inspection plans. In the U.S., the same permits require several years to negotiate and finalize.

44. The authors conclude this from personal observation of the growth of MMC industrial facilities in Japan.

45. Mayor of Naoshima, Japan, public statement on July 14, 1990 (supporting plant operations).

46. The authors conclude this from their observations made during several visits to the island of Naoshima, the site of a major industrial MMC facility which has operated for over 75 years in harmony with 5000 resident neighbors in an area of less than 1500 acres. The authors have continually inspected this facility over a period of 25 years.

47. GRESSER, *supra* note 1, at 279-83.

48. One example is the building of a new copper smelter in only 17 months, occurring after the company had explained the basis for its decisions and obtained overwhelming public support.

stringent on the effluent discharge standard,[49] while Japan appears more stringent on the air quality standard.[50]

E. Comparison of U.S. and Japanese Timetables for Obtaining Permits

In Japan, it takes less time to obtain the permits necessary to begin the construction of an emitting facility than in the United States. Instead of emphasizing the construction and operation permit stage, Japanese law requires the Environmental Bureau to spend a great deal of time and effort on monitoring, sampling, and inspecting sites after the facility is built.

U.S. law tends to focus primarily on the actual permit stage. The permit scheme of environmental statutes and regulations requires industry to use specified technology and show evidence to support an assessment that a permit should be granted. To obtain a permit to operate a major industrial facility in the United States, an applicant must prepare at the start of a project an Environmental Impact Statement (EIS), which requires one to one-and-one-half years to complete.[51]

The State of Texas provides a typical example of U.S. procedures. Considerable time and effort is spent by the EPA Region 6, the Texas Air Control Board, the Texas Water Commission, and the U.S. Army Corps of Engineers during the permit process itself, but not during the subsequent inspection of operating facilities.[52] The EPA seems to be less concerned with enforcing emission standards on existing facilities that might be in violation of the standards; rather, the EPA focuses much of its attention on new source facilities that are trying to acquire permits. The EPA's approach seems to be one of encouraging initial compliance with emissions standards rather than seeking out polluters and discouraging future violations.[53]

Pollution control is performed on a much more regional level in Japan than in the United States. In the heavily industrialized areas of Japan, the prefectures control the effluent discharges, current discharge standards, and the ambient air quality standards. In the United States, local county health districts are generally too understaffed, due to limited budgets, to enforce pollution control standards; therefore, the smallest level of actual regional control lies with the state.

There has been a history of cooperation between government and industry in Japan. When issuing a new plant facilities permit, the Japanese government is willing to acquire and accept limited information from a new source, take at face value the information it receives from the Japanese company, and not require any detailed environmental studies or assessments. More attention seems to be focused on regular monitoring, reporting, and inspecting of the new plants. Also, both the air and water laws allow the government to

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49. *See infra* Appendix B (comparing effluent discharge standards).

50. *See infra* Appendix C (comparing air quality standards).

51. *See infra* part IV (discussing the legal requirements for environmental analysis under U.S. federal law).

52. Dr. Mackey served as the president of Texas Copper Corporation from 1989 through 1993. During this period, the corporation invested over $4 million and over four years to obtain a finding of no significant impact (FONSI) on its permit application.

53. The authors make this conclusion based on their involvement with the permit procedures of a major emitting facility in the U.S.

shut down a plant that is not meeting a required standard. In the United States, as discussed, the EPA focuses most of its attention on the pre-operation permit process.

III. CASE STUDIES: A COMPARISON OF REGULATORY FRAMEWORKS AS APPLIED

Both Japan and the United States have enacted effluent discharge standards for typical elements which a facility will be permitted to emit. An examination of the general Japanese and U.S. standards (taken from a proposed plant in Texas)[54] shows that the United States limits for monitored elements are much lower than those in Japan. An examination of the Japanese national emissions standards for sulfur oxides (SOx) will demonstrate the decentralized manner in which the various levels of Japanese government classify and regulate each region.[55] Emission standards for SOx are set for a given emitting facility by calculating and inserting a *K* value, specified by Cabinet Order,[56] for the region in which the facility is to be located, by means of the following equation:[57]

$$q = K \times 10^{-3} \times He^2$$

Here, *q* is the hourly volume of sulfur oxide emitted in normal cubic meters and *He* is the "effective height" of the stack—the sum of actual height of the stack and the smoke ascent height, in meters.[58] The value of *K*, which varies according to the region, inversely determines the degree of regulation.[59] In other words, a reduction in *K* means stiffer control standards. The standard for SOx has hence been labeled the "*K* value regulation."[60]

The general emission standard for SOx, the *K* value, was made more stringent on September 28, 1976;[61] as a result, all of Japan is now controlled under sixteen *K* factors ranging from 3.00 to 17.5.[62]

In Japan, areas remote from population centers and heavy industry have a higher *K* value, more polluted, heavily industrialized areas have a lower *K* value. For the areas around Tokyo, the *K* value is very low at 1.17; other heavily populated areas also have a low *K* value ranging from 1.75 to 2.34.[63] The United States has no similar framework of *K* factors to address the amounts of SOx which an industrial facility may emit.

At the state level, under the current Texas Air Control Board regulations,[64] new industries are required to perform modeling, using emission data on file, for surrounding

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54. *See infra* Appendix B (listing the actual figures).
55. ENVIRONMENTAL AGENCY, *supra* note 5, at 275-76.
56. *Id.*
57. *Id.*
58. *Id.*
59. *Id.*
60. ENVIRONMENTAL AGENCY, *supra* note 5, at 275-76.
61. *Id.*
62. *See infra* Appendix D (discussing general standards).
63. *See infra* Appendix D (subsection b for new plants).
64. TEX. HEALTH & SAFETY CODE ANN. §§ 381.001-381.023 (1993).

industries near an applicant's new plant site. This modeling work is used to determine the impact of the applicant's emissions on the environment.

In the late 1970s and early 1980s, Japan implemented a three-part approach to control the problem, which resulted in a lowering of the ambient level for SOx. This approach included (1) lowering the sulfur content of imported fuel, (2) desulfurizing heavy oil, and (3) desulfurizing stack gases.[65]

Japan's ability to achieve this improvement depended partly on the relatively simple nature of the problem of SOx produced from burning petroleum that contained sulfur, which in turn allowed for relatively simple technical solutions. Because Japan imports practically all its fuel oil, it was simple to decrease the oil's sulfur content by restricting the importation of high sulfur fuels. The government gave support and subsidies to encourage the importation of low sulfur fuel, the development of petroleum desulfurization devices, and the development of stack gas desulfurization equipment. As a result, Japan today is significantly ahead of the United States in the development and use of SOx control technology.[66]

Applying this regulatory framework to the copper metal industry, the authors compared the U.S. and Japanese environmental standards for air,[67] water,[68] and solid toxic waste.[69] The Japan portions of Appendixes E, F, and G list standards: column 1, the limits enacted by the Environmental Agency; column 2, the limits enacted by the mining bureau of the MITI; and column 3, the limits by local agreement between a copper company and the prefectural governmental agency. The *K* values listed are similar to the *K* values described in the above equation for sulfur dioxide.[70] In the U.S.-Texas column, Appendixes E, F, and G list the existing and the new source EPA guidelines for emissions.

Two copper smelters in El Paso, Texas, namely the ASARCO and Phelps Dodge plants, serve as an example of what occurs in the United States. Both plants operate under agreed court orders which allow exceptions to the current EPA regulations. In 1992, the ASARCO plant was granted permits to retrofit its equipment to lower its SOx emissions (there is a copper refinery in Amarillo, Texas also known as the ASARCO plant). Texas already regulates existing copper plants. In the new source column and under SOx, Appendixes E, F, and G list the limit for converters and other furnaces at 650 parts per million. Special standards apply only to newly constructed facilities.

The maximum limits in Texas for most specific elements, such as cadmium, lead, arsenic, copper, and zinc, in plant effluents are lower than the limits in Japan. Because of the *K* factor regulations, most copper plants in Japan are allowed to discharge more sulphur dioxide than new facilities in Texas.

The examination of regulations summarized in Appendixes E, F, and G clearly demonstrates that there is no uniform basis of comparison of emissions standards for

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65. Dr. Mackey learned of this three-part approach from communications with corporate executives in Japan. Japan now has the technology and equipment to substantially lower the emission of SOx as compared to emissions allowed by existing U.S. technology and equipment.

66. GRESSER, *supra* note 1, at 268-75.

67. *See infra* Appendix E.

68. *See infra* Appendix F.

69. *See infra* Appendix G.

70. *See supra* notes 56-60 and accompanying text; ENVIRONMENTAL AGENCY, *supra* note 5, at 267.

copper plants in the United States and Japan, and that Japan monitors more parameters than does the United States. It appears that Japanese ambient air quality standards and solid waste limits are stricter than those in the United States.

IV. A U.S. LEGAL STRENGTH: THE REQUIREMENT OF AN ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED EMITTING FACILITIES

U.S. law required an EIS for major federal facilities long before Japanese law did. On January 1, 1970, the U.S. federal government passed the National Environmental Policy Act (NEPA).[71] NEPA is an important piece of environmental legislation because it requires federal agencies to perform an environmental assessment to determine whether a major federal action will have adverse environmental effects. NEPA requires that an EIS be "included" in every recommendation or report on proposals for "legislation and other major federal actions significantly effecting the quality of the human environment."[72]

The first step in the preparation of an EIS is to determine whether "federal" action is involved. A "major federal action" encompasses "actions which may be or which are potentially subject to federal control and responsibility."[73] In addition to federal involvement, there must also be a "proposal" for action such as programmatic actions, which are "major" and "significantly affect" the quality of the human environment.[74]

In general, courts reviewing the adequacy of an EIS simply examine the administrative record to ascertain whether it evidences a rational basis for the federal entity's decision to prepare an EIS for a particular project. If a federal agency issues a finding of no significant impact (FONSI) in lieu of requiring the preparation of an EIS, the FONSI should briefly describe the basis for the finding and state that an environmental assessment is sufficient to avoid the lengthy EIS process. Most major U.S. firms now conduct an EIS for large industrial plants in order to save time in obtaining all the required permits.[75]

V. A JAPANESE STRENGTH: COMPENSATION FOR HEALTH DAMAGE

In 1973, the Pollution Health Injury Compensation Act was passed in Japan to establish an administrative structure to oversee compensation payments to people whose health was damaged by pollution.[76] Under the Act, victims of designated diseases arising in officially identified pollution areas were examined by a special Health Damage Certification Council comprising of medical, legal, and other experts.[77] Upon certification, these victims were eligible for reimbursement of their medical expenses and lost earnings. Additional assistance provided victims' survivors with funeral and other

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71. 42 U.S.C. §§ 4321-70(a) (1993).
72. *Id.* § 4321 *et seq.* *See* GOVERNMENT INSTS., INC., ENVIRONMENTAL LAW HANDBOOK 416, 444 (1987).
73. 40 C.F.R. § 15.08.18(a) (1992).
74. *Id.*
75. *Id.*
76. Pollution Health Injury Compensation Act, Law No. 111 (1973).
77. *Id.*

expenses. The polluters were required to pay the entire cost of victim assistance. The Act also provided an apparatus for review of grievances under which victims could petition the prefectural governor or mayor for disposition of compensation benefits, certification, and other actions.

Four major pollution injury suits, which were tried between June 1971 and March 1973, significantly influenced Japanese environmental law.[78] These cases developed the concept of the foreseeable effects of a person's combined acts which imposed responsibility on the person for a resulting disease harmful to the general population. These cases are especially important because the typical Japanese citizen prefers to avoid confrontation over injury due to adverse environmental impact. There is a reluctance to make such injury public, and generally, a victim's initial response is to conceal the existence of deformity or abnormality caused by pollution. Victims are reluctant to discover the cause and usually feel no anger toward those responsible for the injury. Such an attitude also gives rise to a reluctance to assert legal or moral rights; in many instances, the victims were more likely to accept their fate as somehow deserved rather than to blame others.[79]

Under the concept of foreseeability which developed from these cases, a Japanese company is held responsible for its acts which adversely affect human health. If it selects a site for a facility near human settlements, the company is on notice of the clear possibility of harm, and it must employ the best technology available to control its pollution. However, the cases hold that the use of such technology will not shield the companies from liability if other protective measures could have been employed. The cases further hold that emissions regulations are merely guidelines which cannot be used to bar liability and that no prescriptive right to pollute exists. Even compliance with existing regulations is insufficient as a defense when injury has occurred to the human population.[80]

In contrast, the seriousness of health damage from pollution has received little scholarly, professional, or legislative attention in the United States. Further, statutory and case law has not developed an effective approach to compensate human victims of pollution.

VI. CONCLUSION

Japan has enacted strict environmental laws and has enforced controls which have substantially decreased perceivable urban air and water pollution. Japan has achieved impressive results in eliminating pollution linked to serious human health problems. Substantial reductions of airborne SOx and other sulfates have been made, along with reductions of certain waterborne toxic substances, such as mercury and cadmium. Marked

78. *See* Judgment of June 30, 1971, Toyama Dist. Ct., 17 Hanji 635, *aff'd*, Judgment of Aug. 9, 1972, Nagoya High Ct., 25 Hanji 674; Judgment of Sept. 29, 1971, Nigata Dist. Ct., 96 Hanji 642; Judgment of Mar. 20, 1973, Kumamoto Dist. Ct., 15 Hanji 696; Judgment of July 24, 1973, Tsu Dist. Ct., 30 Hanji 672.

79. Frank Upham, *Litigation and Moral Consciousness in Japan: An Interpretive Analysis of Four Japanese Pollution Suits*, 10 L. & SOCIETY 579 (1976).

80. Julian Gresser, *The 1983 Japanese Law for the Compensation of Pollution Related Health Damage: An Introduction Assessment*, 8 L. IN JAPAN 91, 91-92 (1975).

improvements have been made in the control of the flow of toxic substances into rivers and streams.

These are major achievements for which Japan deserves great credit, especially since this progress was accomplished in the face of continuing rapid industrial and economic growth.[81] Indeed, there was an environmental disruption in the postwar period caused by the new structure of the steel, oil, refining, petrochemical, paper pulp, power, and automobile industries. These pollution-prone industries spread across the nation in response to regional development schemes promoted by the government under various legislative umbrellas. Nevertheless, the Japanese experience is discouraging because the nation's sense of crisis diminished once the most easily perceivable air and water pollution problems were mitigated.[82]

The basic structures of Japanese and U.S. environmental laws, such as ambient quality standards and emissions limitations, are similar. However, there are fundamental differences between the Japanese and the U.S. methods of formulating and enforcing environmental policy. Additionally, Japanese environmental law differs strikingly on its focus in providing compensation for health-injury cases related to pollution, as epitomized by their compensation law. Their procedures prevent environmental harm prospectively and provide administrative remedies.[83]

The differences in the Japanese and U.S. environmental laws and national policies can be traced in part to the cultural differences between their respective populations. U.S. and Japanese environmental laws have followed similar paths of change over the last twenty-five years. However, Japan issues permits in a relatively short period of time—months instead of years—for new facilities by avoiding confrontation between the parties at the start. Japan then monitors the operation in a more detailed fashion as compared to the U.S. agencies. Even if the practitioner disagrees with the Japanese emphasis on cooperation between government and industry, and on the supervision of operating facilities, the practitioner advising the client who wishes to build a facility in Japan must grasp these aspects of Japanese environmental law.

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81. The controls may even have had a net positive economic effect by creating new jobs and new industries that design and manufacture pollution control technology; such technology is now furnished to foreign markets in addition to the large domestic market.

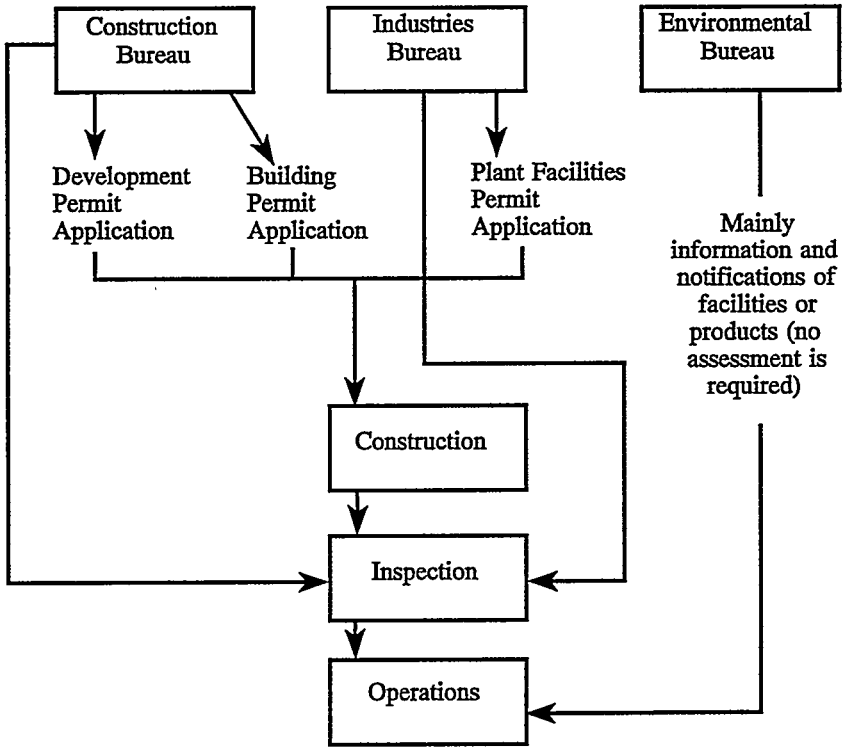
82. RHOADS MURPHEY & ELLEN MURPHEY, THE JAPANESE EXPERIENCE WITH POLLUTION AND CONTROLS 292-93 (1983). In the case of nitrogen oxides, there was an increase in the national ambient levels during the 1970s and early 1980s. *Id.* Water pollution may yet be a serious problem for Japan's closed water bodies, such as lakes and marshes. MICHAEL R. REICH, ENVIRONMENTAL POLICY AND JAPANESE SOCIETY: PART I—SUCCESSES AND FAILURES 194-95 (1983).

83. Bruce Aronson, *Environmental Law in Japan*, 7 HARV. ENVTL. L. REV. 135 (1983) (book review).

APPENDIX A

JAPAN NATIONAL LAWS

PREFECTURAL REGULATIONS



After Operations, regular monitoring reports and site inspections are conducted by ENVIRONMENTAL BUREAU

APPENDIX B

EFFLUENT DISCHARGE STANDARDS
(Milligrams per Liter)

Element	Japan			USA	Texas
	National Law	Local Govt.	Mine & Smelter	N.S.P.S.	(Local Plant)
Zinc	5	5	5	0.05	0.05
Copper	3	1	1	0.07	<0.01
Lead	1	0.5	0.3	0.02	<0.01
Arsenic	0.5	0.3	0.3	0.07	0.03
Cadmium	0.1	0.05	0.03	0.01	<0.01

APPENDIX C

AMBIENT AIR QUALITY STANDARD

Compound	Japan	USA
	PPM	PPM
SO_2	0.04 (24 hours) 0.1 (1 hour)	0.14 (24 hours) 0.50 (3 hours)
NO_2	0.04-0.06 (24 hours) --	-- 0.05 (Annual)
CO	10 (24 hours) 20 (1 hour)	-- 35 (1 hour)
	MG/Nm^3	
TSP	0.10 (24 hours) 0.20	-- --

APPENDIX D

(a) GENERAL STANDARDS

	Area	*K* Value
1	6 areas: Central Tokyo, Yokohama-Kawasaki, Nagoya, Yokkaichi, Osaka-Sakai, and Kobe-Amagasaki	3.0
2	21 areas: Chiba, Fuji, Kyoto, Himeji, Mizushima, Kitakyushu, and others	3.5
3	1 area: Sapporo	4.0
4	4 areas: Hitachi, Kashima, and others	4.5
5	3 areas: Toyama-Takaoka, Kure, and Tokyo	5.0
6	9 areas: Annaka, Niigata, Okayama, Shimonoseki, and others	6.0
7	3 areas: Tomakomai, Hachioji, and Kasaoka	6.42
8	6 areas: Sendai, Fukui, Hiroshima, and others	7.0
9	8 areas: Asahikawa, Utsunomiya, Mihara, Tokushima, and others	8.0
10	8 areas: Akita, Kanazawa, Otsu, Fukuoka, Nagasaki, and others	8.76
11	6 areas: Takasaki, Urawa, Narita, Naha, and others	9.0
12	4 areas: Shizuoka, Sasebo, and others	10.0
13	15 areas: Hakodate, Gifu, Takamatsu, Minamata, and others	11.5
14	6 areas: Mishima, Kurume, and others	13.0
15	20 areas: Aomori, Morioka, Yamagata, Nagano, Kagoshima, and others	14.5
16	Others	17.5

(b) SPECIAL STANDARDS

	Area	*K* Value
6 areas:	Central Tokyo, Osaka-Sakai, Yokohama-Kawasaki, Kobe-Amagasaki, Yokkaichi, and Nagoya	1.17
8 areas:	Chiba, Fuji, Himeji, Mizushima, Kitakyushu, and others	1.75
14 areas:	Kashima, Toyama, Kyoto, Fukuyama, Ohmuta, Ohita, and others	2.34

THE COMPARISON OF ENVIRONMENTAL STANDARDS IN USA AND JAPAN
Related to the Copper Industry
AIR (mg/Nm^3 except marked*)

Item	JAPAN Existing Plants			USA, Texas Existing		USA, Texas New Source		Other Requirements in Texas by Agencies
	EA[1]	MB[2]	Kagawa Prefecture & Naoshima Town[3]	EPA	Texas	EPA	Texas	
Cadmium	1	1	0.5					1. Ground Level Concent.[11] (mg/m^3 except SO_2)
Lead	10	10	5					
Sulphur Oxides	*17.5[8]	*11.5[8]	*185Nm^3/H[9]			*Converter 650 ppm	*Converter 650 ppm	
Nitrogen Oxides	Dryer 200 Anode Furn. 330	Dryer 200 Anode Furn. 330						
Dust	Dryer 150 Anode Furn. 200	Dryer 150 Anode Furn. 200	100			Dryer 50 (20° C)		
Copper			5					

Par.	30 m.	1 h.	3 h.	5 h.	8 h.	24 h.	¼ y.	1 y.
SO_2	0.31		0.2			0.035		0.08
TSP		0.4	0.2	0.1				
PM10							0.15	0.050
NO_x								0.1
CO		40			10			
Lead							0.0015	
Sul. Acid		0.05				0.015		

SO_2: PSD Class II (ppm)

1 EA: Environment Agency Government of Japan
2 MB: Mining Bureau of MITI
3 Agreement between Company and local Municipality
4 Parathion, Methyl parathion, methyl demeton and EPN only
5 Standard value applied to closed water areas such as inland seas
6 Daily average
7 Maximum monthly average mg/kg of 100% H_2SO_4 (standard for the acid plant)
8 *K* value. See Appendix D
9 Total emission limit for Naoshima site
10 See Appendix B
11 See Appendix B

THE COMPARISON OF ENVIRONMENTAL STANDARDS IN USA AND JAPAN
Related to the Copper Industry
WATER (mg/l except marked*)

Item	JAPAN Existing Plants			USA, Texas Existing		New Source		Other Requirements in Texas by Agencies
	EA[1]	MB[2]	Kagawa Prefecture & Naoshima Town[3]	EPA	Texas	EPA	Texas	
Cadmium	0.1	0.1	0.05	0.204		0.204		1. Acute & Chronic Criteria (mg/l)[10]
Cyanide	1	1						
Organic Phosphorus[4]	1	1						
Lead	1	1	0.5	0.332		0.332		
Hexavalent Chrome	0.5	0.5						
Arsenic	0.5	0.5	0.3	1.584		1.584		
Total Mercury	0.005	0.005						
Alkyl Mercury	not det.	not det.						
PCB	0.003	0.003						
pH	*5.0-9.0	*5.0-9.0				*7.5-10.0		
COD	10[5]	10[5]						
SS	150[6]	150[6]	30			30.650		
Copper	3	3	1	1.558		1.558		
Zinc	5	5		1.073		1.073		
Dissolved Iron	10	10						
Dissolved Manganese	10	10						
Chrome	2	2						
Fluorine	15	15		[7]		[7]		

Parameter	Acute Criteria	Chronic Criteria
Cadmium	0.04562	0.01002
Lead	0.14	0.0056
Arsenic	0.149	0.078
Copper	0.00437	0.00437
Zinc	0.098	0.089

2. Discharge water's temperature

[1] EA: Environment Agency Government of Japan
[2] MB: Mining Bureau of MITI
[3] Agreement between Company and local Muncipality
[4] Parathion, Methyl parathion, methyl demeton and EPN only
[5] Standard value applied to closed water areas such as inland seas
[6] Daily average
[7] Maximum monthly average mg/kg of 100% H_2SO_4 (standard for the acid plant)
[8] *K* value. See Appendix D
[9] Total emission limit for Naoshima site
[10] See Appendix B
[11] See Appendix B

THE COMPARISON OF ENVIRONMENTAL STANDARDS IN USA AND JAPAN
Related to the Copper Industry
SOLID WASTE TOXICITY (mg/l)

Item	JAPAN Existing Plants		USA, Texas Existing Plants	
	EA[1]		EPA	
Cadmium	0.3	Solution Test (for landfill)	1.0	Solution Test
Lead	3		5	
Hexavalent Chrome	1.5	Solution liquid:		Solution liquid:
Arsenic	1.5	deionized water plus hydrochloric acid		deionized water plus acetic acid
Alkyl mercury	not detected	; pH 5.8-6.3		; pH 5.0±0.2
Total mercury		Solid material / Solution Liquid = 1 (weight) / 10 (volume)	0.2	Solid material / Solution Liquid = 1 (weight) / 10 (volume)
Chrome			5.0	
Selenium			1.0	
Silver			5.0	
Barium			100	

[1] EA: Environment Agency Government of Japan