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Air Pollution Control in West Germany

David P. Currie†

In 1972, the West German Constitution was amended to empower the federal parliament to enact general air pollution control legislation.¹ Since 1974, the subject has been regulated principally by a federal statute known as the *Bundes-Immissionsschutzgesetz*.² The goals of this article are to describe the main features of the West German law, to compare it with our own Clean Air Act,³ and to offer a few criticisms of both.

The stated purpose of the *Bundes-Immissionsschutzgesetz* is "to protect people, animals, plants, and other things from harmful environmental effects" and "to take precautions against the occurrence of harmful environmental effects."⁴ This purpose is to be pursued by a variety of measures. Facilities of a type "especially apt to cause harmful environmental effects" require a permit,⁵

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† Harry N. Wyatt Professor of Law, University of Chicago Law School; Chairman, Illinois Pollution Control Board, 1970-72. My thanks to the Thyssen Foundation, which made this study possible; to the Universities of Freiburg and Hannover, where the research was done; to various federal and state pollution-control officials in West Germany, with whom I discussed the German law; to Dean Gerhard Casper and Professor Hans Zeisel of the University of Chicago Law School, Professors Hans-Peter Schneider of Hannover, Michael Lehmann of Munich, and Erich Schanze of Frankfurt, and Mr. Thomas Weigend of Freiburg for their help and encouragement; and especially to Professor Eckard Reh binder of Frankfurt for his expert counsel.

¹ GRUNDGESETZ [GG] art. 74 (W. Ger. 1949, amended 1972).

² Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge (law for protection from harmful environmental effects through air pollution, noise, vibrations, and similar occurrences) of Mar. 15, 1974 [Bundes-Immissionsschutzgesetz—BImSchG] (federal environmental protection law), 1974 Bundesgesetzblatt [BGBl] I 721 (W. Ger.) (amended 1974, 1976, 1980), reprinted in BUNDES-IMMISSIONSSCHUTZGESETZ (G. Feldhaus & H. Hansel 2d. ed. 1979). For another copy of the current version, with citations to amendments, see C. SARTORIUS, VERFASSUNGS- UND VERWALTUNGSGESETZE DER BUNDESREPUBLIK DEUTSCHLAND (periodically updated). The statute deals with noise and certain other related environmental problems as well as air pollution. Water pollution is regulated under other statutes. Although the *Immissionsschutzgesetz* is the principal federal law on air pollution, certain aspects of the problem, such as vehicle emission standards, are regulated outside the *Immissionsschutzgesetz* by separate laws. See *infra* notes 193-99 and accompanying text.

³ 42 U.S.C. §§ 7401-7642 (Supp. III 1979).

⁴ BImSchG § 1.

⁵ *Id.* § 4.

which is granted only upon a showing that the facility "cannot" cause "harmful environmental effects"; that "precautions" against such effects will be taken, "in particular by use of emission limitation measures reflecting the state of the art"; and that waste materials are either recycled or properly disposed of, in accordance with technical feasibility and economic supportability.⁶ Under specified circumstances, the responsible officials may impose "subsequent orders" upon facilities already having permits in order "to carry out the duties imposed by [the *Bundes-Immissionschutzgesetz*]."⁷ Facilities not requiring permits are to be so erected and operated that harmful environmental effects avoidable with "state of the art" technology are prevented and others are "confined to a minimum."⁸ If the environmental effects of such a facility nevertheless "endanger human life or health or tangibles of significant value," the facility's operation is to be forbidden to the extent the public or neighboring area cannot otherwise be adequately protected.⁹ The authorities are empowered to adopt additional measures for regions "in which a sharp increase in harmful environmental effects is to be feared during conditions of poor air circulation"¹⁰ and for regions "that require special protection."¹¹ For regions in which "harmful environmental effects occur or are to be expected," there is to be an "air quality maintenance plan" containing "measures for the reduction of air pollution" as well as precautionary measures.¹² Finally, the executive arm of the federal government (*Bundesregierung*), with consent of the Council of State Governments (*Bundesrat*), is authorized to regulate the construction or composition of automobiles, fuels, and certain other facilities or materials.¹³

I. PERMITS

A. Facilities Requiring Permits

Under section 4 of the *Bundes-Immissionsschutzgesetz*, a permit is required for facilities ("*Anlagen*") "that by reason of their

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⁶ *Id.* §§ 5, 6.

⁷ *Id.* § 17.

⁸ *Id.* § 22.

⁹ *Id.* § 25.

¹⁰ *Id.* §§ 40, 49(2).

¹¹ *Id.* § 49(1).

¹² *Id.* § 47.

¹³ *Id.* §§ 32, 34, 35, 38.

construction or operation are especially apt (*in besonderem Masse geeignet*) to cause harmful environmental effects.”¹⁴ Regulations designate nearly 100 such kinds of emission sources,¹⁵ including, as might be expected, such significant sources as large boilers, incinerators, and facilities for the production of ferrous and nonferrous metals.¹⁶ In general, section 4 is similar to the American provisions requiring a permit for a “major stationary source”¹⁷ or a “major emitting facility.”¹⁸

In West Germany, as in the United States, a permit is sometimes required for the modification (“*Änderung*”) of a major facility as well as for initial construction.¹⁹ As in the United States, however, not every modification is included, and thus it is important in West Germany, as it is here, to distinguish between the construction of a new facility and the modification of an existing one. One leading West German case, *Tunnelofen*,²⁰ illustrates the problem. The owner of a brick factory wished to replace one of his existing kilns. If the entire plant constituted a single “facility” (“*Anlage*”), then the new kiln was a modification of an existing facility, and a permit was required only if the modification could be said to be “fundamental” (“*wesentlich*”). The court held, however, that the new kiln was itself a new facility requiring a permit, whether or not it represented a fundamental change in the plant as a whole.²¹ Our “bubble” concept,²² in other words, is not accepted in West Germany. More than the permit itself was at stake, for as in this country, the owner’s substantive duties may be significantly less demanding if no new permit is required.²³

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¹⁴ *Id.* § 4.

¹⁵ Vierte Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung über genehmigungsbedürftige Anlagen) (fourth regulation for the implementation of the federal environmental protection law—regulation concerning plants requiring permits) of Feb. 14, 1975 [Vierte Bundes-Immissionsschutzverordnung—4. BImSchV] (fourth federal environmental protection regulation), 1975 BGBl I 499 (W. Ger.) (amended 1975), reprinted in BUNDES-IMMISSIONSSCHUTZGESETZ, *supra* note 2.

¹⁶ *Id.* § 2(1), (2), (4)-(7).

¹⁷ 42 U.S.C. § 7502(b)(6) (Supp. III 1979).

¹⁸ *Id.* § 7475(a)(1).

¹⁹ BImSchG § 15.

²⁰ Judgment of Dec. 12, 1975, BVerwG, W. Ger., 50 Entscheidungen des Bundesverwaltungsgerichts [BVerwGE] 49 (1977).

²¹ *Id.* at 52-53.

²² See D. CURRIE, AIR POLLUTION: FEDERAL LAW AND ANALYSIS § 3.05 (1981).

²³ In the United States, the new-source performance standards do not apply at all unless the source is “new” or “modified,” and “modification” includes only those changes that increase emissions. 42 U.S.C. § 7411 (Supp. III 1979). In West Germany, a subsequent order limiting emissions of a plant that already has a permit need not meet the standards for

As in the United States, the words of the statute fail to make clear whether each piece of equipment within a plant is a separate "facility." Section 3 defines "facility" to include not only "workplaces" ("*Betriebsstätten*"), but also other stationary "installations" ("*Einrichtungen*")—a term that seems capable of referring either to individual pieces of equipment or to the entire establishment. Nor is the implementing regulation much help; it lists "facilities for the firing of rough ceramic products" ("*grobkeramische Erzeugnisse*"), including "brick factory products" ("*Ziegeleierzeugnisse*"), without making clear whether the relevant facility is the entire operation or its constituent parts.²⁴

In the absence of explicit legislative guidance, the Federal Administrative Court in *Tunnelofen* opted for an interpretation that promoted the statutory protective purpose by subjecting every new kiln to official scrutiny. Moreover, because the same kiln would have required a permit if it had not been part of an existing plant, it is difficult to argue that its emissions were, in contemplation of the statute, too insignificant to warrant the cost of a permit proceeding. The *Tunnelofen* problem demonstrates, if it needed to be demonstrated, that it is no easier to draft or to interpret statutes in West Germany than it is here.

B. Requisites for Permit Issuance

The basic requirement for issuance of a permit is compliance with "the duties arising from § 5" and from its implementing regulations.²⁵ Section 5 is thus the critical provision, and it provides as follows:

Facilities requiring permits shall be so constructed and operated that

1. harmful environmental effects and other dangers, substantial detriments, and substantial burdens upon the public and the neighborhood cannot be caused,
2. precautions are taken against harmful environmental effects, in particular by use of emission-limitation measures reflecting the state of the art, and
3. waste materials generated in the operation of the facilities are recycled in an orderly and harmless manner or,

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initial permit issuance. See *infra* notes 155-63 and accompanying text.

²⁴ 4. BImSchV § 2(3).

²⁵ BImSchG § 6.

insofar as this is not technically feasible or economically supportable, disposed of in an orderly manner.²⁶

1. "*Harmful Environmental Effects.*" The first requisite for a permit—that "harmful environmental effects" ("*schädliche Umwelteinwirkungen*") "cannot be caused" ("*nicht hervorgerufen werden können*") by the facility—has been called the central principle of the *Bundes-Immissionsschutzgesetz*.²⁷ It is similar to the American provision forbidding the construction of a major new facility that would cause a violation of ambient air quality standards, which in turn are set at a level intended to prevent environmental harm.²⁸ The West German requirement, however, differs from ours in several important respects.

a. *An absolute duty?* At first glance, the West German law seems to impose an absolute duty to cause no environmental harm, but "harmful environmental effects" are defined in section 3 as "dangers, substantial detriments, or substantial burdens" ("*Gefahren, erhebliche Nachteile oder erhebliche Belästigungen*") upon the public or the neighborhood.²⁹ Trivial damage thus is to be ignored,³⁰ reasonably enough: *de minimis non curat lex*.

The question remains whether section 5 forbids all *substantial* air pollution damage without regard to the cost of abatement.

²⁶ The German text reads as follows:

Genehmigungsbedürftige Anlagen sind so zu errichten und zu betreiben, dass

1. schädliche Umwelteinwirkungen und sonstige Gefahren, erhebliche Nachteile und erhebliche Belästigungen für die Allgemeinheit und die Nachbarschaft nicht hervorgerufen werden können,
2. Vorsorge gegen schädliche Umwelteinwirkungen getroffen wird, insbesondere durch die dem Stand der Technik entsprechenden Massnahmen zur Emissionsbegrenzung, und
3. die beim Betrieb der Anlagen entstehenden Reststoffe ordnungsgemäss und schadlos verwertet oder, soweit dies technisch nicht möglich oder wirtschaftlich nicht vertretbar ist, als Abfälle ordnungsgemäss beseitigt werden.

²⁷ 1 G. FELDHAUS, BUNDESIMMISSIONSSCHUTZRECHT 8 (2d ed. 1980).

²⁸ See 42 U.S.C. §§ 7409-7410 (Supp. III 1979).

²⁹ BImSchG § 3 (emphasis added).

³⁰ The word "substantial" qualifies only "detriments" and "burdens," not "dangers." Although one leading commentator finds it "obvious" that only "substantial" dangers are outlawed, 1 G. FELDHAUS, *supra* note 27, at 10, the legislative history shows that the difference in phrasing was deliberate: "detriments" and "burdens" were thought generally less severe than "dangers," and insubstantial harms were omitted based on a balancing of interests ("*Güterabwägung*"). BEGRÜNDUNG, Entwurf eines Gesetzes zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge (official explanation of the draft of a law for protection against harmful environmental effects from air pollution, noise, vibrations, and similar occurrences), DRUCKSACHEN DES DEUTSCHEN BUNDESTAGES [BTDRUCKS.] 7/179 at 21, 29 (W. Ger. 1973) [hereinafter cited as BEGRÜNDUNG DES GESETZENTWURFS].

Other sections of the *Immissionsschutzgesetz* explicitly refer to cost,³¹ but section 5(1) does not. One is tempted to conclude that cost is relevant only when mentioned, yet two leading commentators argue that a balancing of interests is implicit in the term "substantial" ("*erheblich*"),³² and it seems to be generally agreed that the duty in question is limited by a general "proportionality principle" ("*Grundsatz der Verhältnismässigkeit*"),³³ in light of which the legislature is always presumed, and indeed required, to act. This principle is said to require a "reasonable relationship between the costs and benefits" ("*eine vernünftige Relation zwischen Aufwand und Nutzen*") of any measure to be adopted.³⁴ Therefore, despite the literal terms of section 5, it should serve to avoid an interpretation that would require unreasonable expenditures for air pollution abatement. Our Clean Air Act unfortunately contains no such general safety valve.³⁵

b. *Air quality standards.* To determine on a case-by-case basis whether a proposed facility would cause environmental harm would make it difficult for the permit applicant to predict what was required and would create a risk of unequal treatment. To give more certainty, the *Bundesregierung* is authorized to adopt, with the consent of the *Bundesrat*, "regulations" ("*Rechtsverordnungen*")³⁶ and "guidelines" ("*Verwaltungsvorschriften*")³⁷ to carry out the statute. Among the examples of guidelines expressly mentioned in the statute are "ambient standards" ("*Immissionswerte*"), "which for the purpose stated in § 1 may not be exceeded" ("*nicht überschritten werden dürfen*").³⁸ By virtue of this authority the *Bundesregierung* has promulgated in the guideline

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³¹ E.g., BImSchG § 17(2)(1) (subsequent orders for existing facilities forbidden if not "economically supportable"); *id.* § 41(2) (requirement that highways and railroads be constructed so that no harm will be caused by traffic noise inapplicable "to the extent that the costs of protective measures would be unreasonable in relation to the desired goal").

³² 1 G. FELDHAUS, *supra* note 27, at 12; D. SELLNER, IMMISSIONSSCHUTZRECHT UND INDUSTRIEANLAGEN 17 (1978).

³³ D. SELLNER, *supra* note 32, at 14-15. Cf. BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 32 (noting the applicability of the proportionality principle to the statutory "state of the art" provisions).

³⁴ This formulation comes from a judicial decision respecting the state of the art. Judgment of July 17, 1978, OVerwG W. Berlin, 94 Deutsches Verwaltungsblatt [DVBl] 159, 160 (1979). The definition in the legislative history is similar. See BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 32.

³⁵ See generally D. CURRIE, *supra* note 22, §§ 5.01-6.15.

³⁶ BImSchG § 7.

³⁷ *Id.* § 48.

³⁸ *Id.* § 48(1).

known as the *TA-Luft* both long- and short-term ambient standards for a number of pollutants: dustfall, suspended particulates, chlorine, hydrochloric acid, hydrofluoric acid, carbon monoxide, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, and nitric oxide.³⁹

i. The weight given the standards. According to the *TA-Luft*, one of the three conditions for issuance of a permit is that "the ambient standards not be exceeded in the area affected by the facility, by reason of its operations."⁴⁰ That is to say, by prescribing ambient concentrations that are harmless, the ambient standards are intended to make concrete and specific the section 5 duty not to cause environmental harm. They are similar in this respect to our own air quality standards.⁴¹

In the United States, ambient standards have the force of law, but this is not the case in West Germany. The *TA-Luft* is only a guideline, not a regulation, and it is said to bind neither the polluter nor the courts.⁴² Indeed, the general principle in West Germany seems to be that the courts need afford no deference to administrative expertise in the application of vague statutory terms such as "harmful environmental effects."⁴³ One lower court went so far as to hold (in the so-called *Voerde* case) that administrative guidelines could not narrow the scope of judicial review at all: ambient standards served merely to indicate a "range" of values ("*Bandbreite*") "characterizing the unknown transition zone ("*Übergangsbereich*") between harmful and harmless environmental effects," and a case-by-case judicial determination of harm was required.⁴⁴

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³⁹ Erste Allgemeine Verwaltungsvorschrift zum Bundes-Immissionsschutzgesetz (first general administrative guidelines for the federal environmental protection law) of Aug. 28, 1974 [Technische Anleitung zur Reinhaltung der Luft—*TA-Luft*] (technical guide for the purification of the air) §§ 2.4.2, 2.4.3 (W. Ger.), reprinted in BUNDES-IMMISSIONSSCHUTZGESETZ, *supra* note 2. The long-term standard is basically an annual arithmetic average; the short-term standard must be met by 95% of the individual readings taken over the long term. *Id.* §§ 2.5.2.1, 2.5.2.3.3.

⁴⁰ *TA-Luft* § 2.2.1.1(b).

⁴¹ See 42 U.S.C. § 7409(b)(1)-(2) (Supp. III 1979).

⁴² 1 G. FELDHAUS, *supra* note 27, at 3-4.

⁴³ The legislative history makes this point explicitly. See BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 31, describing the permit requisites of section 5 as "indeterminate legal concepts" ("*unbestimmte Rechtsbegriffe*") allowing the administrator no discretion and stating that the courts might review administrative interpretations "in full compass" ("*im vollen Umfang*").

⁴⁴ Judgment of July 7, 1976, OVerwG Münster, 91 DVBl 790, 795 (1976), *rev'd*, Judgment of Feb. 17, 1978, BVerwG, W. Ger., 55 BVerwGE 250 (1979).

The lower court's decision was vigorously criticized as undermining the ambient standards and leaving the law uncertain.⁴⁵ To the outside observer, it also seems quite incompatible with the statute's command that ambient standards "may not be exceeded."⁴⁶ In response to the decision, the government proposed to amend the law to make ambient standards legally binding in the absence of proof that compliance with them was insufficient to prevent environmental damage,⁴⁷ but even before the amendment was formally introduced, it was rendered unnecessary, for the offending decision was reversed by the Federal Administrative Court.⁴⁸ Though the ambient standards lacked the force of law, the court held they were scientifically based and thus could be considered "anticipatory expert testimony" ("*antizipiertes Sachverständigen-gutachten*"), which in the absence of new knowledge established the boundaries of harmful effects.⁴⁹ In the case before the court, where there was no evidence of harm, it was therefore proper to issue a permit on the condition and with the expectation that ambient standards would not be violated.⁵⁰ Thus, by what appears to the outsider a rather tortured path, the court managed to give the ambient standards what one commentator aptly describes as "prima facie" effect.⁵¹

ii. *Content of the standards.* To the American observer, it is striking that there is no ambient standard for ozone in West Germany. In this country ozone, as an indicator of photochemical smog, is considered our most refractory air pollution problem—not only in California, as originally believed, but in large cities everywhere.⁵² In West Germany as well, the government has reported that ozone levels in heavily populated areas "repeatedly" exceed 300 micrograms per cubic meter⁵³—a concentration American in-

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⁴⁵ E.g., Soell, *Aktuelle Probleme und Tendenzen im Immissionsschutzrecht*, 13 *ZEITSCHRIFT FÜR RECHTSPOLITIK* 105 (1980).

⁴⁶ BImSchG § 48.

⁴⁷ See Entwurf eines Zweiten Gesetzes zur Änderung des Bundes-Immissionsschutzgesetzes (draft of a second bill of amendments to the federal environmental protection law) art. 1, sec. 3(a), § 6a(1), BTDrucks. 8/2751 at 4, 4 (W. Ger. 1979) [hereinafter cited as Entwurf eines Zweiten Gesetzes].

⁴⁸ Judgment of Feb. 17, 1978, BVerwG, W. Ger., 55 BVerwGE 250 (1979).

⁴⁹ *Id.* at 260-61.

⁵⁰ *Id.* at 270-71.

⁵¹ D. SELLNER, *supra* note 32, at 31-32.

⁵² See 43 Fed. Reg. 8962, 8962-63 (1978).

⁵³ ERSTER IMMISSIONSSCHUTZBERICHT DER BUNDESREGIERUNG (first environmental protection report of the Bundesregierung), BTDrucks. 8/2006, at 11 (W. Ger. 1978) [hereinafter cited as IMMISSIONSSCHUTZBERICHT].

investigators have found harmful to health.⁵⁴ Unless their measurement methods differ significantly from ours, the West Germans seem slow to recognize this problem.

That there is no ambient standard for ozone, however, does not seem to mean that the operator has no duty to avoid harmful ozone concentrations, for although ambient standards help to make specific the duty imposed by section 5, that duty is not merely to avoid violating ambient standards, as in the United States;⁵⁵ it is to avoid "harmful environmental effects" altogether, whether or not the offending pollutant is covered by specific standards. In this respect, the West German statute seems preferable to the American.

Equally striking for the American reader are the concentrations prescribed by the West German ambient standards. The long-term West German standard for sulfur dioxide is 140 micrograms per cubic meter, while the American standard is 80.⁵⁶ Similarly, West Germany allows 200 micrograms of particulates per cubic meter; the United States, only 60.⁵⁷ One cannot be certain that the West German standards are really less stringent without knowing whether measurement methods are comparable in the two countries, but the levels of sulfur and particulates permitted in West Germany, if based on comparable test methods, have been found dangerous to human health.⁵⁸

If the West German standards are actually more lenient than ours, a possible explanation is that the cost of compliance was considered in setting them. In the United States, cost is not supposed to be considered; ambient standards are to avoid all harm to health or welfare.⁵⁹ But in West Germany, as we have seen, the section 5 duty that the standards particularize is limited by cost considerations under the proportionality principle.⁶⁰ This is just as well, for by definition unreasonable expenditures ought not to be required. But that is not to say that the apparently lax standards in the *TA-*

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⁵⁴ NATIONAL AIR POLLUTION CONTROL ADMIN., U.S. DEP'T OF HEALTH, EDUC. & WELFARE, PUB. NO. AP-63, AIR QUALITY CRITERIA FOR PHOTOCHEMICAL OXIDANTS 10-13 (1970).

⁵⁵ See 42 U.S.C. § 7410(a)(2) (Supp. III 1979).

⁵⁶ Compare *TA-Luft* § 2.4.3 with 40 C.F.R. § 50.4 (1981).

⁵⁷ Compare *TA-Luft* § 2.4.2.2 with 40 C.F.R. § 50.7 (1981).

⁵⁸ NATIONAL POLLUTION CONTROL ADMIN., U.S. DEP'T OF HEALTH, EDUC. & WELFARE, PUB. NO. AP-50, AIR QUALITY CRITERIA FOR SULFUR OXIDES 162 (1969); NATIONAL AIR POLLUTION CONTROL ADMIN., U.S. DEP'T OF HEALTH, EDUC. & WELFARE, PUB. NO. AP-49, AIR QUALITY CRITERIA FOR PARTICULATE MATTER 189 (1969).

⁵⁹ 42 U.S.C. § 7409(b) (Supp. III 1979).

⁶⁰ See *supra* notes 32-35 and accompanying text.

Luft are justified by a comparison of costs and benefits. As I will show later,⁶¹ even in the most polluted areas, the West Germans have refrained from requiring measures that we have found cost-justified. Further, the standards generally are not tailored to the varying costs of compliance in different regions; with one interesting exception considered below,⁶² the same concentrations are permissible everywhere.

iii. Compliance with the standards. The basic duty of the operator of a facility requiring a permit is to avoid causing environmental harm. Confirming the implication of the statutory language, the Federal Administrative Court in the *Voerde* case held the means by which this goal is accomplished to be irrelevant: stack-gas cleaning, fuel substitution, modified production processes, high stacks, and the retirement or modification of other facilities are all acceptable, as long as the ambient standards are met.⁶³ American courts decided otherwise even when the statute read like its West German counterpart,⁶⁴ and now our statute expressly provides that air quality standards must be met by reducing rather than by dispersing emissions.⁶⁵ The West German interpretation is more faithful to the statutory terms, and on its face it seems to satisfy the declared statutory policy of avoiding environmental harm. There may be persuasive policy reasons, however, for disapproving of dispersion as a primary method of air pollution control,⁶⁶ and in fact the independent precautionary clause of section 5 imposes additional obligations that are considered below.⁶⁷

A final problem with the West German ambient standards is that they must be met only within a limited measuring zone ("*Messgebiet*"), which for a stack 300 meters high is only sixteen by sixteen kilometers and which is often only four by four.⁶⁸ Pollutants can have harmful effects far from their source, and section 5 contains no geographical limitation; its provision that the facility cause no environmental damage appears to mean that no such damage is to be caused anywhere. Thus the guidelines seem inade-

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⁶¹ See *infra* notes 140-49 and accompanying text.

⁶² See *infra* notes 209-11 and accompanying text.

⁶³ Judgment of Feb. 17, 1978, BVerwG, W. Ger., 55 BVerwGE 250, 266-67 (1979).

⁶⁴ E.g., *Natural Resources Defense Council, Inc. v. EPA*, 489 F.2d 390, 410-11 (5th Cir. 1974), *modified on other grounds*, 421 U.S. 60 (1975).

⁶⁵ 42 U.S.C. § 7423 (Supp. III 1979).

⁶⁶ See *infra* notes 148-49 and accompanying text.

⁶⁷ See *infra* notes 83-115 and accompanying text.

⁶⁸ TA-Luft § 2.5.2.1.

quate to carry out the statutory direction, and the *Bundesrat* accordingly has urged that the *TA-Luft* be amended to make the measuring zone as extensive as the area affected by emissions from the facility.⁶⁹

c. *New facilities in nonattainment regions. i. The TA-Luft.* On its face, section 5 seems to prohibit the construction of any new polluting facilities in areas where the ambient standards already are exceeded, for in such areas the air is already harmful, and new emissions necessarily would contribute to further environmental harm. Such a result could be economically disastrous, and the *TA-Luft* accordingly contains provisions allowing the construction of new facilities in nonattainment areas if either of two conditions is satisfied. The first is that the new facility replace ("*ersetzt*") an existing facility of the same type ("*gleiche Art*") and that total emissions as well as ambient concentrations be "substantially reduced" ("*erheblich vermindert*").⁷⁰ The second is that prescribed emissions reduction measures be exhausted and that a general air quality maintenance plan ("*Luftreinhalteplan*") adopted by the state (*Land*) government under section 47 give assurance that the ambient standards will be met through control of existing sources "in the future" ("*künftig*").⁷¹

The idea is praiseworthy; pollution control should not be pursued to the point of unreasonable cost. But the details of the provisions raise significant questions. Why must the facility shut down

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⁶⁹ BESCHLUSS DES BUNDESRATES ZUR VERWALTUNGSVORSCHRIFT ZUR ÄNDERUNG DER ERSTEN ALLGEMEINEN VERWALTUNGSVORSCHRIFT ZUM BUNDES-IMMISSIONSSCHUTZGESETZ (TECHNISCHE ANLEITUNG ZUR REINHALTUNG DER LUFT—TA LUFT) (resolution of the *Bundesrat* concerning the *Bundesregierung's* proposed amendments to the first general guidelines on the federal environmental protection law (technical guide for purification of the air)), BTDRUCKS. 8/2751 at 36, 38 (W. Ger. 1979). The *Bundesregierung*, however, urged that the measuring area be left unchanged. See Verwaltungsvorschrift zur Änderung der Ersten Allgemeinen Verwaltungsvorschrift zum Bundes-Immissionsschutzgesetz (Technische Anleitung zur Reinhaltung der Luft—TA Luft) (draft amendments to the first general guidelines on the federal environmental protection law (technical guide for purification of the air)) art. 1, sec. 10, § 2.6.2.2., BTDRUCKS. 8/2751 at 19, 24 (W. Ger. 1979) [hereinafter cited as Verwaltungsvorschrift zur Änderung]; VORLÄUFIGE STELLUNGNAHME DER BUNDESREGIERUNG ZU DEM BESCHLUSS DES BUNDESRATES ZUR VERWALTUNGSVORSCHRIFT ZUR ÄNDERUNG DER ERSTEN ALLGEMEINEN VERWALTUNGSVORSCHRIFT ZUM BUNDES-IMMISSIONSSCHUTZGESETZ (TECHNISCHE ANLEITUNG ZUR REINHALTUNG DER LUFT—TA LUFT) (preliminary opinion of the *Bundesregierung* with regard to the opinion of the *Bundesrat* on the *Bundesregierung's* draft amendments to the first general guidelines on the federal environmental protection law (technical guide for purification of the air)), BTDRUCKS. 8/2751 at 45, 46 (W. Ger. 1979).

⁷⁰ TA-Luft § 2.2.1.3.

⁷¹ *Id.* § 2.2.1.4.

be "of the same type" as the new one? Why must it be replaced, not merely better controlled? What matters to the public, as the Federal Administrative Court confirmed in another context in the *Voerde* case,⁷² is the quality of the air; it should be immaterial by what means the improvement is achieved.

Moreover, the provisions of the *TA-Luft* are vague. What constitutes a "substantial" reduction in emissions or in ambient concentrations? What does it mean that ambient standards must be met "in the future"? Such uncertain terms create prospects of unequal enforcement and of protracted delays that are exacerbated by the fact that the administration of these provisions is in the hands of the states (*Länder*).

More serious is the question whether the guideline provisions authorizing construction in nonattainment areas are consistent with the statute. The argument in their favor is that they promote the purpose of the law because they permit new sources only on conditions resulting in overall improvement of air quality.⁷³ The difficulty is that, in the language of section 5, emissions from the new source nevertheless will contribute to continuing environmental harm.

ii. The proposed amendment. To remedy the present uncertainty, the *Bundesregierung* in 1979 proposed to amend the *TA-Luft* provisions and to make them a part of the statute. First, a "cleanup clause" ("*Sanierungsklausel*") would allow new construction in a nonattainment area if total emissions were "substantially reduced" ("*erheblich vermindert*") through shutdown or modification of an existing facility, or if ambient quality were correspondingly improved by other means.⁷⁴ It no longer would be necessary for the existing facility to be of the same type as the new one, or for it to be shut down completely. A simultaneous amendment of the *TA-Luft* would specify that an emission reduction of fifty per-

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⁷² Judgment of Feb. 17, 1978, BVerwG, W. Ger., 55 BVerwGE 250, 267 (1979) (construing the statutory provision, BImSchG §§ 5, 6, that permit-requiring facilities not cause environmental harm).

⁷³ D. SELLNER, *supra* note 32, at 35.

⁷⁴ Entwurf eines Zweiten Gesetzes, *supra* note 47, art. 1, sec. 3(b), § 6b, BTDrucks. 8/2751, at 4; BEGRÜNDUNG, Entwurf eines Zweiten Gesetzes zur Änderung des Bundes-Immissionsschutzgesetzes (official explanation of the draft of a second bill of amendments to the federal environmental protection law), BTDrucks. 8/2751 at 6, 8 (W. Ger. 1979) [hereinafter cited as BEGRÜNDUNG DES ZWEITEN GESETZENTWURFS].

cent from the old and new facilities combined would qualify as "substantial."⁷⁵

A second provision of the proposed amendment ("*Luft-reinhalteplanklausel*") would allow new construction on the basis of an air quality maintenance plan, building once again on the present guidelines in the *TA-Luft*. Three conditions would have to be met: there would have to be an "overriding public interest" ("*überwiegendes öffentliches Interesse*") in the construction of the new source; the plan would have to provide that air quality be "substantially improved" ("*erheblich verbessert*") within three years; and the new source would be required not to "endanger human health" ("*Gefahren für die menschliche Gesundheit hervor[rufen]*").⁷⁶ A new *TA-Luft* provision would specify that a "substantial" improvement generally requires violations of ambient standards to be reduced by one-third.⁷⁷ These amendments would have the advantage of reducing some current uncertainty but would leave undefined the critical term "overriding public interest." If taken too seriously, this qualification could limit greatly the utility of the provision.⁷⁸

iii. *Comparison.* These West German efforts to deal with new sources in nonattainment areas are strikingly parallel to the American experience. In the United States, too, the statute seemed to forbid new facilities in such areas altogether.⁷⁹ Here, too, the government first attempted to ameliorate the overly strict statutory prohibition by issuing administrative guidelines.⁸⁰ In both countries, the government eventually decided to write permissive provisions into the statute itself.⁸¹ Moreover, the American law offers the same two basic options for new sources in polluted areas that are found in the *TA-Luft* and the proposed amendment to the German statute: a more than equivalent reduction of emissions

⁷⁵ Verwaltungsvorschrift zur Änderung, *supra* note 69, art. 1, sec. 12, § 2.8.1, BTDRUCKS. 8/2751, at 34.

⁷⁶ Entwurf eines Zweiten Gesetzes, *supra* note 47, art. 1, sec. 3(c), § 6c, BTDRUCKS. 8/2751, at 5; BEGRÜNDUNG DES ZWEITEN GESETZENTWURFS, *supra* note 74, at 9.

⁷⁷ Verwaltungsvorschrift zur Änderung, *supra* note 69, art. 1, sec. 12, § 2.8.2, BTDRUCKS. 8/2751, at 34.

⁷⁸ The proposed amendments are part of a package that has been stalled by disagreements between the *Bundesregierung* and the *Bundesrat*, largely over other provisions; so far they have not been adopted, and the government evidently does not plan to pursue them.

⁷⁹ 42 U.S.C. § 7410(a)(4) (Supp. III 1979).

⁸⁰ 41 Fed. Reg. 55,528 (1976).

⁸¹ 42 U.S.C. § 7503 (Supp. III 1979). See generally D. CURRIE, *supra* note 22, §§ 6.01-6.15. For the German counterpart, see *supra* note 74 and accompanying text.

from existing sources in the individual case (emission offset), or general air quality improvement through an overall implementation plan. These provisions, however, became law in the United States as early as 1977; in West Germany, it is still not clear whether a new source may ever be constructed where ambient standards are exceeded.

2. *Precautionary Measures.* In addition to the duty not to cause environmental harm, the operator of a facility requiring a permit must take "precautions (*Vorsorge*) against harmful environmental effects, in particular (*insbesondere*) by use of emission-limitation measures (*Massnahmen zur Emissionsbegrenzung*) reflecting the state of the art (*Stand der Technik*)."⁸² This requirement raises several interesting questions.

a. *State of the art everywhere?* As noted above, the *TA-Luft* guidelines for issuance of a permit, interpreting and making concrete the commands of sections 5 and 6, require basically that ambient standards not be exceeded. They also require that the facility be provided with "emission limitation equipment reflecting the state of the art."⁸³ Thus the *Bundesregierung* seems to be of the opinion that the precautionary principle of section 5(2) demands the employment of state-of-the-art technology on all facilities requiring permits.

This issue has not reached the Federal Administrative Court, but lower courts so far have agreed with the *Bundesregierung's* interpretation. The highest court in West Berlin, for example, declared in the so-called *Bewag* case that the precautionary principle permitted only those emissions that were "unavoidable" (*unvermeidlich*).⁸⁴ Thus, the court required sulfur dioxide emissions from a new power plant to be reduced as far as the state of the art allowed, even though ambient standards could have been met with less stringent controls.

Such a requirement is familiar to the American observer, for the Clean Air Act requires that major new sources not only comply with ambient standards, but utilize the best available control technology as well.⁸⁵ I have elsewhere attempted to suggest why legislatures might wish to impose such requirements.⁸⁶ In West Germany,

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⁸² BImSchG § 5(2).

⁸³ TA-Luft § 2.2.1.1. On the requirements of sections 5 and 6, see *supra* notes 25-69 and accompanying text.

⁸⁴ Judgment of July 17, 1978, OVerwG, W. Berlin, 94 DVBl 159, 159 (1979).

⁸⁵ 42 U.S.C. §§ 7411(a)(1), 7475(a)(4), 7503(2) (Supp. III 1979).

⁸⁶ Currie, *Rulemaking under the Illinois Pollution Law*, 42 U. CHI. L. REV. 457, 491-95

however, the *Bewag* decision has been attacked as a misconstruction of the statute, for section 5(2) requires the use of state-of-the-art technology not as such, but only as a "precaution against harmful environmental effects." Absent proof that emissions otherwise would create a risk of future environmental damage, it is argued, the state of the art cannot be required.⁸⁷ There is force to this argument, for the statutory reference to precautions against harm presumably was intended to have some meaning. Moreover, the statute requires that precautions be taken not "by use of" state-of-the-art technology, but "especially" or "in particular" ("*insbesondere*") by such means. The implication may be that lesser precautions sometimes suffice. On the other hand, the difficulty with these arguments is that they threaten to render the entire precautionary principle of section 5(2) redundant, for if one complies with section 5(1) by establishing that emissions will not cause environmental damage, one necessarily has taken adequate precautions against the occurrence of such harm.

Legislative history suggests a middle road that avoids treating either all or part of section 5(2) as superfluous. According to the official explanation submitted by the *Bundesregierung* with the proposed legislation, the precautionary principle was meant to serve the "interest of industry"; its aim was "to avoid later having to forbid the construction of new industrial undertakings" because of the existing burden of pollution.⁸⁸ That is to say, state-of-the-art technology must be used to the extent necessary to preserve room for future industry and to assure that the air's limited assimilative capacity as defined by ambient standards is allocated fairly among competing claimants.

The interest of future industry has been invoked in the United States, too, in favor of measures that go beyond immediate compliance with ambient standards.⁸⁹ The West German law, however, seems poorly worded for this purpose. Moreover, it is not clear just when the interest of future industry requires state-of-the-art control. One commentator says it always does, because air pollutants

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(1975).

⁸⁷ Judgment of July 17, 1978, OVerwG, W. Berlin, 94 DVBl 159, 163-64 (1979) note H. Papier; Sellner, *Zum Vorsorgegrundsatz im Bundes-Immissionsschutzgesetz*, 33 NEUE JURISTISCHE WOCHENSCHRIFT 1255, 1256 (1980).

⁸⁸ BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 32.

⁸⁹ See Currie, *supra* note 86, at 491-95.

can be transported long distances,⁹⁰ but this view has been hotly disputed.⁹¹

At this point, with a bit of *Schadenfreude*, one may again draw the unsurprising conclusion that American legislators are not the only ones who on occasion have difficulty expressing their intentions in statutory terms.

b. *Defining the state of the art. i. In general.* Section 3(6) defines "state of the art" as that "state of development of advanced (*fortschrittlich*) processes, equipment, or methods of operation which gives assurance of the practicability (*praktische Eignung*) of an emission limitation measure." Legislative history adds that the technology must be "especially effective" ("*besonders wirksam*") and "already proven in operation" ("*im Betrieb bewährt*").⁹² As with best available technology under our Clean Air Act,⁹³ a great deal of latitude is left to the administrators and to the courts.

Though the statute does not say so, legislative history and judicial decision confirm that the general principle of proportionality⁹⁴ must be observed in determining the state of the art. As the court said in *Bewag*, the state-of-the-art provision contemplates a "reasonable relation" ("*vernünftige Relation*") between the "costs and benefits" ("*Aufwand und Nutzen*") of control.⁹⁵ Again, the American law is similar: our "best technological system" is to be determined with regard for its cost.⁹⁶

Although dispersion of emissions through high stacks is an acceptable method of compliance with ambient standards in West Germany,⁹⁷ it is clear, as was held in the *Bewag* case, that high stacks cannot qualify as the state of the art,⁹⁸ for section 5(2) requires measures for "emission limitation" ("*Emissionsbegrenzung*"), and section 3(6) defines state of the art with reference to the "limitation" of emissions, not to their dispersion.

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⁹⁰ Feldhaus, *Der Vorsorgegrundsatz des Bundes-Immissionsschutzgesetzes*, 95 DVBl 133, 138-39 (1980).

⁹¹ See *supra* note 87 and accompanying text.

⁹² BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 32. The statement that the technology must be "proven in operation" seems incompatible with the statute, which says only that methods proven in operation are "in particular" to be included. BImSchG § 3(6).

⁹³ 42 U.S.C. § 7411(a)(1) (Supp. III 1979).

⁹⁴ See *supra* notes 32-35 and accompanying text.

⁹⁵ Judgment of July 17, 1978, OVerwG W. Berlin, 94 DVBl 159, 160 (1979).

⁹⁶ 42 U.S.C. § 7411(a)(1) (Supp. III 1979).

⁹⁷ See *supra* note 63 and accompanying text.

⁹⁸ Judgment of July 17, 1978, OVerwG W. Berlin, 94 DVBl 159, 159-60 (1979).

ii. *The TA-Luft*. Section 48 specifically authorizes the adoption of federal guidelines specifying "emission standards" ("*Emissionswerte*") achievable with state-of-the-art technology, as well as other measures to carry out the statute. Accordingly, the *TA-Luft* contains many provisions defining the state of the art for various categories of sources. Many are garden-variety emissions limitations expressed in terms such as milligrams per cubic meter.⁹⁹ Others, pursuant to the general provision of section 48 authorizing measures other than emission standards, impose particular technical requirements such as low combustion temperatures and exhaust gas recirculation to control nitrogen oxides.¹⁰⁰

Where practicable, numerical performance standards seem preferable, because they allow the operator to choose the most economical means of achieving compliance. The original American provision flatly requiring "emission standards" went too far, however, because it was uncharitably construed to forbid any regulation at all if a numerical standard was not feasible.¹⁰¹ The current American provision permitting design or work practice rules only when performance standards are impracticable¹⁰² is sound in theory, but it may contribute more to uncertainty and litigation expense than to efficient methods of compliance; in any event, the West German guidelines are by no means chary in their use of numerical emissions standards.

The particular *TA-Luft* provisions defining the state of the art are interesting to the American reader. For example, flue gas desulfurization, long controversial in the United States,¹⁰³ was declared practicable for larger fuel-burning units in West Germany as early as 1974;¹⁰⁴ the *Bewag* decision confirmed this conclusion.¹⁰⁵ Coke oven emissions, also a serious technological problem here,¹⁰⁶ were required in the same year to be reduced during both charging and pushing operations.¹⁰⁷ There are especially strict general emission standards for fine particulates,¹⁰⁸ which are particularly dan-

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⁹⁹ *E.g.*, *TA-Luft* § 2.3.3.4.

¹⁰⁰ *E.g.*, *id.* § 3.1.1.2.

¹⁰¹ *Adamo Wrecking Co. v. United States*, 434 U.S. 275 (1977), criticized in D. CURRIE, *supra* note 22, § 3.27.

¹⁰² 42 U.S.C. §§ 7411(h), 7412(e) (Supp. III 1979).

¹⁰³ See D. CURRIE, *supra* note 22, § 3.10.

¹⁰⁴ *TA-Luft* § 3.1.1.4.

¹⁰⁵ Judgment of July 17, 1978, *OverwG W. Berlin*, 94 DVBl 159, 160 (1979).

¹⁰⁶ Emission Standards, 4 Ill. P.C.B. 298, 320-21 (1972).

¹⁰⁷ *TA-Luft* § 3.29.1.1(b), (d).

¹⁰⁸ *Id.* § 2.3.3.1 & illustration 1.

gerous because they penetrate deeply into the lungs; this problem has been discussed but not yet dealt with in the United States.

The *TA-Luft* also contains emission standards for a long list of particulates divided into three categories according to toxicity; the most dangerous, including asbestos, beryllium, cadmium, and lead, may not exceed twenty milligrams per cubic meter.¹⁰⁹ In the United States, we have especially strict standards for a mere handful of "hazardous pollutants" under section 112 of the Clean Air Act;¹¹⁰ others are governed only by the general particulate standards.

It would be interesting to know the basis on which the West German standards were determined. They appear to be offered as examples of the state of the art, and it is certainly reasonable in determining what technology is practicable to conclude that a greater expense is justifiable when the danger is extreme. Nevertheless, one wonders how the *Bundesregierung* determined that especially dangerous particulates of so many types, from a variety of sources, could practicably be reduced to twenty milligrams per cubic meter. The suspicion lurks that these standards may have been based more upon risk than upon practicability. If so, the West German experience is the converse of our own. In the United States, where standards for hazardous pollutants are supposed to be set at levels adequate to prevent adverse health effects, the administering agency has begun to set them instead according to the state of the art,¹¹¹ in West Germany, ostensible state-of-the-art standards may have been set at levels designed to protect public health.

The *TA-Luft* makes no exception for extraordinary circumstances such as malfunction, start-up, or the blowing of soot from a stack. The state of the art, however, is supposed to describe what is *achievable* by advanced technology; it can hardly be expected that emission control devices will function at full efficiency at all times, and this is acknowledged in American practice.¹¹²

c. *Beyond the state of the art.* The original draft of the West German statute would have flatly required use of state-of-the-art technology.¹¹³ As adopted, the law requires only that the operator

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¹⁰⁹ *TA-Luft* § 2.3.3.4.

¹¹⁰ 42 U.S.C. § 7412 (Supp. III 1979).

¹¹¹ See 40 Fed. Reg. 59,534 (1975); 41 Fed. Reg. 46,550 (1976).

¹¹² See *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 398-99 (D.C. Cir. 1973); 43 Fed. Reg. 42,186 (1978).

¹¹³ Entwurf eines Gesetzes zum Schutz vor schädlichen Umwelteinwirkungen durch

take precautions "in particular" through state-of-the-art measures. I have already considered the possibility that this language may permit some operators to get away with less than the state of the art.¹¹⁴ According to one commentator, the same language may also mean that in some cases the state of the art is not enough.¹¹⁵ Both conclusions may be correct: the state of the art is the normal requirement, but ultimately decisive are the precautionary measures necessary to make room for future sources in the particular case.

3. *Other Duties.* The final requisite for issuance of a permit is the orderly disposition or, preferably, reclamation of "waste materials generated in the operation of the facilities."¹¹⁶ What is interesting to the American reader about this requirement is that it has very little to do with air pollution.¹¹⁷ Other provisions of the permit sections, moreover, address matters unrelated not only to air pollution, but to environmental protection generally. Section 4 requires a permit not only for facilities likely to do environmental damage, but also for those likely to injure the public or the neighborhood "in other ways" (*"in anderer Weise"*). Section 5(1) requires the source to cause neither environmental harm nor "other (*sonstige*) dangers, substantial detriments, and substantial burdens,"¹¹⁸ while section 6(2) requires the applicant to demonstrate compliance with "other public law provisions (*öffentlich-rechtliche Vorschriften*) and requirements of worker protection (*des Arbeitsschutzes*)." Section 13 provides that the permit shall incorporate (*"schliesst . . . ein"*) most "other official decisions" (*"andere . . . behördliche Entscheidungen"*) affecting the facility. In other words, the permit proceeding is comprehensive, serving interests outside the pollution statute itself, in order to expedite consideration of all relevant requirements and to lend certainty to the operator's obligations.¹¹⁹ Such a unified proceeding has been much discussed but not prescribed at the federal level in the United States.

Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge (draft of a law for protection against harmful environmental effects from air pollution, noise, vibrations, and similar occurrences) § 6, BTDRUCKS. 7/179 at 2, 6 (W. Ger. 1973).

¹¹⁴ See *supra* notes 83-91 and accompanying text.

¹¹⁵ 1 G. FELDHAUS, *supra* note 27, at 9.

¹¹⁶ BImSchG § 5(3).

¹¹⁷ The disposition of solid waste in general is regulated by a separate statute, the Abfallbeseitigungsgesetz (waste disposal law) of Jan. 5, 1977, 1977 BGBl I 41 (W. Ger.).

¹¹⁸ See 1 G. FELDHAUS, *supra* note 27, at 13 (danger of fire or explosion).

¹¹⁹ BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 28.

C. Summary

The permit procedure is an important tool for achieving the purpose of the West German air pollution law. Anyone who wishes to construct a facility of a type capable of causing serious air pollution first must show that the facility will cause no harm and that he has taken precautions that often, if not always, include state-of-the-art control technology. Not all types of emission sources require permits, however, though they may cause environmental damage. Moreover, although section 5 expressly requires a permit for operation ("*Betrieb*") as well as for construction ("*Errichtung*") of a facility, it seems to be taken for granted that only new or modified sources require permits.¹²⁰ Further, the source owner's reliance interest entitles him to insist that the permit be issued for an indefinite period;¹²¹ he need not face a renewal proceeding in which he would have to demonstrate that his facility still satisfies the requirement of section 5. These limitations mean that the permit requirement is of no assistance when *existing* sources cause environmental harm; other provisions of the statute, however, are designed to deal with these problems.

II. AIR QUALITY MAINTENANCE PLANS

A. When, Why, and by Whom

A "burdened region" ("*Belastungsgebiet*"), according to section 44(2), is one in which there "occurs or is to be expected" air pollution that "can cause harmful environmental effects in especial degree (*in besonderem Masse*).¹²² Under section 47, the responsible state agency in such a region is to establish an "air quality maintenance plan" ("*Luftreinhalteplan*") containing a detailed description of the problem, "measures for the reduction of air pollution," and "precautionary measures" ("*Massnahmen zur Verminderung der Luftverunreinigungen und zur Vorsorge*").

In several respects, the plans contemplated by this section are reminiscent of the American plans for the implementation of ambi-

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¹²⁰ See 1 G. FELDHAUS, *supra* note 27, at 6. Some textual support for this conclusion may be drawn from sections 10(3) and 10(4), which speak of the permit applicant's "project" ("*Vorhaben*"); from the provision of section 67(2) requiring that facilities existing at the time a permit requirement becomes effective be "designated" ("*angezeigt*") rather than that they obtain permits; and from the less stringent provisions of section 17 for "subsequent orders" affecting facilities with permits.

¹²¹ BImSchG § 12(2) (permit for limited period only upon application of source owner). See 1 G. FELDHAUS, *supra* note 27, at 9-10.

ent air quality standards under section 110 of the Clean Air Act.¹²² In West Germany, too, a principal aim of the plan is compliance with ambient standards, for those standards help to define the regions in which environmental harm occurs. In both countries, moreover, a plan may be required for preventive purposes even though ambient standards are not yet exceeded.¹²³

In the United States, however, the plan is concerned solely with pollutants for which there are ambient standards. In West Germany, if the statute means what it says, this is not the case, for section 47 speaks generally of "air pollution" ("*Luftverunreinigungen*") and of measures for its reduction; it seems to contemplate control of all harmful pollutants, whether or not covered by ambient standards. In this respect, the West German law seems preferable to ours.

The plan is to be adopted by "the agency responsible under state law" (*die "nach Landesrecht zuständige Behörde"*);¹²⁴ and the *Bundesregierung* is given no power to adopt measures of its own in default of adequate state action, or to enforce a plan if the state does not. Our law is otherwise, for we are inclined to fear that, if given the last word, the states would be insufficiently zealous to combat pollution; it was the failure of state control efforts that led to the enactment of the federal law in the first place. In West Germany, however, this enforcement scheme is nothing out of the ordinary, for the constitution requires that most federal laws be enforced by state officials.¹²⁵ The constitution does provide for federal "supervision" of state enforcement, but the remedies available in case the *Länder* are found to be dragging their heels seem less than reassuring to an American observer.¹²⁶

B. The Measures Required in a Plan

In comparison with the detailed statutory provisions prescrib-

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¹²² 42 U.S.C. § 7410 (Supp. III 1979).

¹²³ *Id.*

¹²⁴ BImSchG § 47.

¹²⁵ GG arts. 83-85, 87b-d, 89-90.

¹²⁶ The *Bundesregierung* can be empowered by statute to issue directives to the state government "in particular cases" ("*für besondere Fälle*") with respect to the execution of federal laws, GG art. 84(5), and in general the *Bundesregierung* has the authority to "take necessary measures" ("*die notwendigen Massnahmen treffen*") to ensure fulfillment of the state's duties under federal law, *id.* art. 37 [*Bundeszwang*]. But in both cases, the approval of the *Bundesrat*, which consists of representatives of the state governments, is required. The *Bundeszwang* seems to be viewed as an extreme measure not to be invoked routinely.

ing the contents of an American implementation plan,¹²⁷ the measures required in a West German plan are defined rather vaguely. The statute says only that they must serve "to reduce air pollution" and as "precautions." To the outside observer, it is striking that section 47 never clearly prescribes *how great* a reduction ("Verminderung") of pollution is required. In the United States, the plan must provide for achieving and maintaining ambient standards.¹²⁸ Commentary, supported by the statutory purpose of preventing environmental harm announced in section 1, assures us that this is also true in West Germany,¹²⁹ and the plans so far adopted are designed to meet ambient standards.¹³⁰

The cryptic reference in section 47 to "precautions" ("Vorsorge") also seems unclear. Arguably, it requires only that measures be taken to prevent the future occurrence of harmful effects that, in the language of section 44, merely are "to be expected" ("zu erwarten"). In section 5, however, the same term has a broader significance.¹³¹ Perhaps an air quality maintenance plan, too, must take care to make room for future industry—as by requiring greater control of existing sources than is necessary to comply with ambient standards. Moreover, section 47 prescribes no deadlines for carrying out the plan. Maybe a reasonable time is implicit, but even if it is, the statute affords ample latitude for the *Länder* to drag their feet. Finally, as with the general duty of a permit-requiring facility under section 5(1) to avoid environmental harm,¹³² it seems to make no difference by what means the prescribed reduction of air pollution is achieved. The choice among available measures appears to lie within the discretion of the *Länder*.

C. The Plans

Only a handful of air quality maintenance plans have been es-

¹²⁷ 42 U.S.C. § 7410 (Supp. III 1979).

¹²⁸ 42 U.S.C. § 7410(a)(2)(A), (B) (Supp. III 1979).

¹²⁹ Feldhaus, *Luftreinhaltepläne—rechtliche Möglichkeiten und Grenzen*, 1978 BAURECHT 260, 260.

¹³⁰ E.g., MINISTERIUM FÜR ARBEIT, GESUNDHEIT UND SOZIALES DES LANDES NORDRHEIN-WESTFALEN, LUFTREINHALTEPLAN RUHRGEBIET OST 1979-83 *passim* (1978); MINISTERIUM FÜR ARBEIT, GESUNDHEIT UND SOZIALES DES LANDES NORDRHEIN-WESTFALEN, LUFTREINHALTEPLAN RUHRGEBIET WEST 1978-82 *passim* (1977); HESSISCHE MINISTER FÜR LANDESENTWICKLUNG, UMWELT, LANDWIRTSCHAFT UND FORSTEN, LUFTREINHALTEPLAN RHEIN-MAIN *passim* (1981) [hereinafter cited as RUHRPLAN-OST, RUHRPLAN-WEST, and RHEIN-MAIN-PLAN].

¹³¹ See *supra* notes 83-115 and accompanying text.

¹³² See *supra* note 63 and accompanying text.

tablished in the seven years since the statute was adopted. A close look at three of the current plans may help in understanding the operation of section 47 in practice.

1. *The Eastern Ruhr*. The plan for the eastern Ruhr region is a document of over 350 thick, glossy pages filled with impressive maps and tables. It contains a mass of valuable information about the ambient concentrations, harmful effects, and sources of various pollutants. The plan itself emphasizes, however, that measures for the reduction of those concentrations are its "critical (*entscheidend*) part,"¹³³ and of its 350 pages, only 14 are devoted to this "critical" topic.

The central principle of the plan is that, insofar as industrial pollution is concerned, ambient standards are to be met "essentially only through emission reduction measures (*Emissionsminderungsmaßnahmen*) directed toward individual sources."¹³⁴ These measures are to be drawn in part from the requirements of the *TA-Luft* "by analogy" ("*zum Vergleich*"), but with an eye to the *TA-Luft* provision that for existing facilities, the state of the art is not an absolute requirement, but a goal to be striven for ("*angestrebt*").¹³⁵ "The responsible administrative officials," we are also told, will introduce "improvement measures" ("*Verbesserungsmaßnahmen*") to reduce ambient sulfur dioxide concentrations "to eighty to ninety percent of the allowable values."¹³⁶ To this point, the plan falls short of prescribing measures for reducing pollution, as section 47 requires; it simply promises that such measures will be prescribed in the future.

To be sure, the plan also contains several "examples for the technical solution of problems," including "the installation of . . . dry electrostatic precipitators" to reduce emissions from a named steelmaking facility to "150 mg/m³ and less."¹³⁷ Only the administering officials, however, have "detailed individual lists" of concrete measures for pollution reduction.¹³⁸ In the United States, an implementation plan contains regulations prescribing emission limitations and other measures designed to assure attainment of ambient standards.¹³⁹ In West Germany, the individual lists given to

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¹³³ RUHRPLAN-OST, *supra* note 130, at 21.

¹³⁴ *Id.* at 199.

¹³⁵ *Id.*; *TA-Luft* § 2.2.5.3.

¹³⁶ RUHRPLAN-OST, *supra* note 130, at 200.

¹³⁷ *Id.* at 205.

¹³⁸ *Id.*

¹³⁹ 42 U.S.C. § 7410(a)(2)(B) (Supp. III 1979).

enforcement officials presumably fulfill this function and can be deemed part of the overall plan. It is noteworthy, however, that the document marketed as the "plan" does not itself contain what is acknowledged to be its "critical part."

2. *The Western Ruhr.* The plan for the western Ruhr region is similar. Violations of the ambient sulfur dioxide standard are more serious here than in the eastern region, however, and the plan lays out the basic principles of a remedial program. The plan acknowledges that flue gas desulfurization is practicable for large new facilities,¹⁴⁰ but it declines to require desulfurization of emissions from existing sources, on grounds of "substantial technical misgivings" ("*erhebliche technische Bedenken*") and "disputed" ("*bestritten*") economic feasibility.¹⁴¹ Furthermore, although the plan attributes fully forty-five percent of ambient sulfur concentrations in the heavily polluted center of Duisburg to small residential and commercial fuel-burning sources,¹⁴² it contains no measures for reducing their emissions. Two reasons are given: the possibilities for controlling small residential fuel-burning sources already have been "extensively exhausted," and it is preferable in any event to leave such "local problems" to local government.¹⁴³ Accordingly, the plan largely eschews the reduction of present emissions and instead relies essentially upon high stacks to disperse them.¹⁴⁴

An American comparison is instructive. To conform dangerous sulfur dioxide levels to ambient standards, the Illinois Pollution Control Board ordered existing emissions reduced as early as 1972.¹⁴⁵ For large sources, the board concluded that flue gas desulfurization was feasible and economically reasonable; small sources could comply by switching from coal to gas.¹⁴⁶ Today there is substantially no sulfur dioxide problem in Illinois.¹⁴⁷

Does it matter that North Rhine-Westphalia has chosen to meet ambient standards by building high stacks instead of reducing emissions? The *Bundesregierung* has made clear its concern

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¹⁴⁰ See *supra* notes 103-05 and accompanying text.

¹⁴¹ RUHRPLAN-WEST, *supra* note 130, at 225.

¹⁴² *Id.* at 258-59.

¹⁴³ *Id.* at 243, 259.

¹⁴⁴ *Id.* at 257.

¹⁴⁵ Emission Standards, 4 Ill. P.C.B. 298, 298 (1972).

¹⁴⁶ *Id.* at 329-34.

¹⁴⁷ See Illinois Environmental Protection Agency, 3 State Implementation Plan for the State of Illinois (Sulfur Dioxide) 8-9 (Draft Apr. 1, 1979).

that the dispersion of pollutants through high stacks increases ambient concentrations in distant regions still relatively clean.¹⁴⁸ Even if this degradation is of no immediate concern, it consumes a valuable portion of the air's assimilative capacity and thus constricts the room available for additional sources; emissions in the Ruhr may yet have to be reduced to allow further development elsewhere. High stacks, which are not themselves cheap, therefore may be at best a short-term solution, and it seems arguable that excessive reliance upon them may offend the precautionary requirement of section 47.

Moreover, increased downwind concentrations may be immediately harmful, even if they do not offend ambient standards. They may affect a scenic or recreational area in which particularly clean air is of special value; they may cause acid rain damaging to animal and vegetable life; and ambient levels based upon incomplete knowledge may turn out not to be harmless after all.¹⁴⁹ The decision to disperse sulfur dioxide emissions rather than to reduce them by flue gas desulfurization and conversion from coal may not be contrary to the West German statute, but it ought to be.

3. *The Rhein-Main Area.* The Rhein-Main plan published by the *Land* Hessen for the Wiesbaden area in 1981, in contrast, is something of a model. First, it sets as goals not only the existing ambient standards, but the stricter standards proposed and not yet adopted, as well as safe concentrations of pollutants (such as carbon disulfide) for which the *TA-Luft* prescribes no ambient standards.¹⁵⁰ Second, it provides for attainment of the sulfur dioxide standard not by the construction of high stacks, but by the switching of significant industrial sources to gas fuel and by the prohibition of solid and liquid fuel in the highly polluted center of Wiesbaden.¹⁵¹ Finally, the plan provides for preservation of open spaces to permit circulation of fresh mountain air¹⁵²—an interesting application of land use planning techniques as a tool of air pollution control that ought to serve as a stimulus for similar measures in the United States.

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¹⁴⁸ IMMISSIONSSCHUTZBERICHT, *supra* note 53, at 11.

¹⁴⁹ See H.R. REP. NO. 294, 95th Cong., 1st Sess. 106-12, 131-33 (1977); Currie, *supra* note 86, at 494.

¹⁵⁰ See, e.g., RHEIN-MAIN-PLAN, *supra* note 130, at 85 (nitrogen dioxide, carbon monoxide), 96 (dustfall, hydrocarbons), 97 (hydrogen sulfide, carbon disulfide), 102 (hydrochloric and hydrofluoric acid), 108-09 (acetone, ethyl oxide, formaldehyde, methanol).

¹⁵¹ *Id.* at 151, 214, 225, 228-29.

¹⁵² *Id.* at 236-61.

D. Legal Status of the Plans

The most troublesome feature of the West German air quality maintenance plan is that, unlike its American counterpart, it does not have the force of law. In the United States, violation of the regulations contained in a plan subjects the polluter to a variety of sanctions;¹⁵³ in West Germany, plan measures can be carried out only pursuant to powers given elsewhere in the statute.¹⁵⁴ Thus the West German plan is never more than a statement by *Land* authorities that in the future, they will require specified control measures to be taken, for section 47 itself confers no power to control pollution. The planning process does have the salutary effect of inducing administrators to consider the air pollution problem as a whole, and this may facilitate development of an adequate and fair control strategy. To ascertain whether the law conveys sufficient authority to achieve its goal of cleaning up polluted areas, however, we must look to other provisions.

III. EXISTING PERMIT-REQUIRING FACILITIES

A. Subsequent Orders

The principal means of imposing new control obligations on existing sources of a type requiring permits is the subsequent order ("*nachträgliche Anordnung*"), which *Länder* authorities may issue under section 17 "to fulfill the duties imposed by [the *Bundes-Immissionsschutzgesetz*]" and by regulations issued under it.¹⁵⁵ That is to say, orders can ("*können*") be issued to compel additional "precautionary" measures¹⁵⁶ as well as to compel measures necessary to avoid environmental harm.¹⁵⁷ The agency not only may, but normally should ("*soll*"), issue an order if "the public or the neighborhood is not adequately protected (*nicht ausreichend . . . geschützt*) from harmful environmental effects"—if, for example, ambient standards are exceeded. Two important conditions limit the availability of subsequent orders: as a rule, no order may be issued if it is "not achievable" with "state-of-the-art" technology ("*nach dem Stand der Technik nicht erfüllbar*"), or if it is "not

¹⁵³ 42 U.S.C. §§ 7413, 7604 (Supp. III 1979).

¹⁵⁴ 1 G. FELDHAUS, *supra* note 27, at 4-5; D. SELLNER, *supra* note 32, at 178.

¹⁵⁵ BImSchG § 17(1).

¹⁵⁶ *Id.* § 5(2).

¹⁵⁷ *Id.* § 5(1).

economically supportable" ("*wirtschaftlich nicht vertretbar*").¹⁵⁸

It makes perfect sense to take the cost of compliance into account, and the law should not require control measures that cost more than they are worth. The literal command of section 17, however, is not merely that subsequent orders be economically reasonable, as certain other measures are required to be,¹⁵⁹ but that they be economically "supportable." This contrast implies, and the commentary confirms, that the polluter as a rule must be able to bear the cost; a measure is not economically supportable if it leaves him unable to make "a reasonable profit" ("*ein angemessener Gewinn*").¹⁶⁰

Several caveats must be added. First, a delayed order may be issued if the technical or economic obstacle is expected to disappear over time. Second, the individual operator's inability to bear the cost does not prevent issuance of an order that would be tolerable to the industry as a whole; the unusually weak operator is not protected.¹⁶¹ Finally, the technical and economic conditions of section 17(2) do not limit the issuance of orders against facilities built before there was any applicable permit requirement: they are entitled to less protection, according to the commentary, because they have not been investigated and approved in a permit proceeding.¹⁶² Nevertheless, it seems likely that cases will occur in which the technical and economic restrictions of section 17 will prevent the issuance of subsequent orders whose public benefits substantially exceed the loss they cause the operator.¹⁶³

B. Permit Revocation

The unavailability of a subsequent order for technical or economic reasons, however, does not leave the public wholly defenseless against existing polluters holding permits. If an order is called for but cannot be issued, the permit is to be revoked, in whole or

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¹⁵⁸ *Id.* § 17(1).

¹⁵⁹ *See id.* § 41(2), quoted in pertinent part *supra* note 31.

¹⁶⁰ D. SELLNER, *supra* note 32, at 180-83. W. HOPPE, WIRTSCHAFTLICHE VERTRETBARKEIT IM RAHMEN DES BUNDES-IMMISSIONSSCHUTZGESETZES 77-78 (1977).

¹⁶¹ W. HOPPE, *supra* note 160, at 31-32 & n.21. It has been questioned whether this provision imposes an unconstitutional taking of property without compensation. D. SELLNER, *supra* note 32, at 181.

¹⁶² 1 G. FELDHAUS, *supra* note 27, at 10-11.

¹⁶³ In fact, federal officials with whom I spoke in the summer of 1981 could recall only one case in which a subsequent order was issued.

in part, "under the conditions of § 21."¹⁶⁴ Two clauses of section 21 are relevant here. The first permits revocation on the basis of facts arising after issuance of the permit that would have justified denying it, but only if "the public interest would be endangered" ("*das öffentliche Interesse gefährdet würde*") in the absence of revocation.¹⁶⁵ The second, more simply, authorizes revocation to prevent or to eliminate "serious detriment to the general welfare" ("*schwere Nachteile für das Gemeinwohl*").¹⁶⁶

It seems doubtful that these provisions suffice to achieve the *Immissionsschutzgesetz*'s stated purpose of eliminating environmental harm,¹⁶⁷ for the contrast between "harmful environmental effects" in section 5 and danger to the "public interest" or "serious detriment" in section 21 suggests that environmental harm alone is not enough to trigger revocation.¹⁶⁸ Thus it appears that not all significant environmental harm can be eliminated by revocation even if the cost of abatement is less than the benefits.

For the American observer, however, the most interesting aspect of section 21 is that when a permit is revoked, the owner is entitled to compensation for the loss he suffers in justifiable reliance on the permit.¹⁶⁹ Our law knows no such requirement; forbidding pollution is unlikely to be held an unconstitutional taking of property.¹⁷⁰ The West German counterpart of our taking clause does not seem to require compensation under these circumstances, for its terms appear to mean both that no one has a property right to injure the public, and that in granting a permit, the government may reserve the right to take later protective measures.¹⁷¹ On a

¹⁶⁴ BImSchG § 17(2).

¹⁶⁵ *Id.* § 21(1), para. 3.

¹⁶⁶ *Id.* para. 5.

¹⁶⁷ *Id.* § 1.

¹⁶⁸ Indeed, to equate either "public interest" or "serious detriment" with environmental harm would render at least part of the provision for new facts superfluous. Environmental harm in itself satisfies the requirement that the new facts justify denial of a permit; if it also satisfied the independent "public interest" requirement, the latter would serve no purpose. Similarly, if environmental harm invariably meant "serious detriment," there would be no reason to make special provision for facts arising after the permit is issued. Commentary confirms that "serious detriment" must be "especially grave." 1 G. FELDHAUS, *supra* note 27, at 7.

¹⁶⁹ BImSchG § 21(4).

¹⁷⁰ See, e.g., *Goldblatt v. Town of Hempstead*, 369 U.S. 590 (1962).

¹⁷¹ Article 14 of the *Grundgesetz* provides that the "content and limits" ("*Inhalt und Schranken*") of property "are defined by statute" ("*werden durch die Gesetze bestimmt*") and that "Property imposes duties. Its use shall also serve the general welfare." ("*Eigentum verpflichtet. Sein Gebrauch soll zugleich dem Wohle der Allgemeinheit dienen.*")

policy level, it seems unfortunate from the standpoint of simple justice that one must be paid not to poison one's neighbors. Moreover, the compensation requirement may impede attainment of the statutory goal of avoiding environmental harm, for although in theory the authorities should be willing to pay for any revocations that would produce net social benefits, political opposition to additional taxes seems likely to confirm the prediction that few permits will be revoked as long as compensation is required.¹⁷²

IV. FACILITIES NOT REQUIRING PERMITS

Facilities of types not "especially apt" to cause pollution do not require permits.¹⁷³ Yet the aggregation of many such sources can cause serious harm. Section 22 therefore requires that facilities not requiring permits be so constructed and operated that environmental harm is either "prevented" or "reduced to a minimum," in either case "in accordance with the state of the art."

Both "harmful effects" and "state of the art" are terms familiar from the permit requirements of section 5.¹⁷⁴ But whereas section 5 at least arguably demands both the elimination of all harm and the universal use of state-of-the-art controls, section 22 demands neither. It forbids only such harm as state-of-the-art controls can prevent, and it requires such controls only so far as necessary to prevent harm.¹⁷⁵ Additional tools therefore are provided to help achieve the statutory goal.

Section 23 authorizes the adoption of regulations imposing obligations on nonpermit sources "for the protection of the public and the neighborhood from harmful environmental effects." Commentary confirms that these measures are not limited to making concrete the general duty imposed by section 22; apparently they may go beyond the state of the art to prevent harm.¹⁷⁶ Moreover, the regulations so far adopted under this provision appear to impose state-of-the-art requirements everywhere,¹⁷⁷ although section

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¹⁷² D. SELLNER, *supra* note 32, at 184.

¹⁷³ See BImSchG § 4.

¹⁷⁴ See *supra* notes 26-62, 83-115, and accompanying text.

¹⁷⁵ 1 G. FELDHAUS, *supra* note 27, at 11.

¹⁷⁶ *Id.* at 4.

¹⁷⁷ Neufassung der Ersten Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung über Feuerungsanlagen) (revised first regulation for the implementation of the federal environmental protection law—regulation concerning furnaces) of Feb. 2, 1979 [Erste Bundes-Immissionsschutzverordnung—1. BImSchV] (first federal environmental protection regulation), 1979 BGBI I 165 (W. Ger.) (particulates from fuel com-

23 contains no analogue of the section 5 "precaution" requirement.

The implication that uniform state-of-the-art requirements fall within the power to protect against "harmful environmental effects" seems difficult to reconcile with the *Voerde* holding that substantially identical language in section 5(1) requires only satisfaction of ambient standards.¹⁷⁸ Yet "emission limitations" and "technical requirements" are expressly included as examples in section 23, and the legislative history confirms the inference that they may be made geographically uniform, as such regulations commonly are.¹⁷⁹ If this is true, it is not clear that the explicit "precautions" requirement in section 5(2) adds anything at all to the statute, and we are close to the surprising conclusion that the *Bundesregierung* has as much power over facilities that do not require permits as it has over those that do.¹⁸⁰

Operation of a nonpermit facility may be prohibited under section 25 for disobedience of an order enforcing the duty imposed by section 22 or by a section 23 regulation. Section 25 further provides, however, for prohibiting operation whenever the harmful effects of such a facility "endanger human life or health or tangibles of significant value (*bedeutende Sachwerte*)," if there is no other way to protect the public interest. This provision, too, appears to go beyond the general duty imposed by section 22: like the provision for permit revocation,¹⁸¹ it is not limited by the state of the art. If there is no permit, moreover, there is no requirement that the polluter be compensated, for the state has given him no assurance on which he is entitled to rely. As in the case of permit revo-

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bustion); Siebente Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung zur Auswurfbegrenzung von Holzstaub) (seventh regulation for the implementation of the federal environmental protection law—regulation concerning limitation of sawdust emissions) of Dec. 18, 1975 [Siebente Bundes-Immissionsschutzverordnung—7. BImSchV] (seventh federal environmental protection regulation), 1975 BGBl I 3133 (W. Ger.) (sawdust); Zweite Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung über Chemischreinigungsanlagen) (second regulation for the implementation of the federal environmental protection law—regulation concerning dry cleaning establishments) of Aug. 28, 1974 [Zweite Bundes-Immissionsschutzverordnung—2. BImSchV] (second federal environmental protection regulation), 1974 BGBl I 2130 (W. Ger.) (volatile organics from dry cleaning establishments). The foregoing regulations are all reprinted in *BUNDES-IMMISSIONSSCHUTZGESETZ*, *supra* note 2.

¹⁷⁸ Judgment of Feb. 17, 1978, BVerwG, W. Ger., 55 BVerwGE 250, 266-67 (1979); *see supra* text accompanying note 63.

¹⁷⁹ *BEGRÜNDUNG DES GESETZENTWURFS*, *supra* note 30, at 25.

¹⁸⁰ Indeed, in one sense, it has *more* power; for in contrast to the revocation of a permit under section 21, *see supra* notes 164-72 and accompanying text, the shutdown of a facility not requiring a permit does not require compensation. *See infra* text following note 181.

¹⁸¹ *See supra* notes 164-72 and accompanying text.

cation, however, the mere occurrence of harm is not sufficient to justify a shutdown order; otherwise, the additional requirement of danger to life, health, or "significant" property would be superfluous.

V. PRODUCT REGULATIONS

Not all pollution comes from "facilities," and even in the case of "facilities," there are sometimes advantages in taking corrective action at the production stage. Therefore the *Bundes-Immissionschutzgesetz* authorizes a variety of regulations respecting the composition or manufacture of equipment or materials: emission standards and technical requirements for "machines, implements and other movable equipment" and for "mass-produced components" of plants or of "other stationary installations";¹⁸² requirements respecting the "construction, equipment, operation, and testing" of vehicles;¹⁸³ and requirements for the composition of fuels¹⁸⁴ and other materials.¹⁸⁵

These authorizations are more comprehensive than their American counterparts. The only unconditional powers of this nature conferred by the Clean Air Act relate to the production of vehicles, to vehicle fuels, to aircraft emissions, and to protection of the stratosphere.¹⁸⁶ Insofar as additional measures of this type are needed to comply with ambient standards, our Federal Environmental Protection Agency may adopt them if the states do not,¹⁸⁷ but the German provisions are not limited to achieving ambient standards.

All the West German provisions authorize the adoption of regulations "for protection against harmful environmental effects." Evidently, however, this does not mean they are limited, like the first clause of section 5, essentially to the implementation of ambient standards,¹⁸⁸ for the legislative history indicates that they are intended as "precautions."¹⁸⁹ Nor do the West German provisions appear to be limited to prescribing the current state of the art, as was originally proposed with respect to vehicles. The *Bundesrat*

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¹⁸² BImSchG § 32.

¹⁸³ *Id.* § 38.

¹⁸⁴ *Id.* § 34.

¹⁸⁵ *Id.* § 35.

¹⁸⁶ 42 U.S.C. §§ 7450-7459, 7521, 7545, 7571 (Supp. III 1979).

¹⁸⁷ *Id.* § 7410(c)(1).

¹⁸⁸ See *supra* notes 26-69 and accompanying text.

¹⁸⁹ See BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 21.

objected to this proposal "because it gives no incentive for the development of technology,"¹⁹⁰ and accordingly, most of the provisions expressly authorize regulations to take effect after a grace period to permit technological improvement. Similar technology-forcing authority in the United States seems to have helped expedite improvements in the control of vehicle exhaust.¹⁹¹

Relatively few production-level regulations have been adopted under the West German provisions. The *Bundesregierung* has limited the sulfur content of light heating oil and diesel fuel,¹⁹² but not of solid fuels; it has limited or forbidden production of vinyl chloride, PCB's, and PCT's,¹⁹³ but not of fluorinated hydrocarbons.¹⁹⁴ Some of the most important measures to control pollution at the production stage, in fact, have been adopted outside the *Immissionsschutzgesetz*. Thus, although section 34 of the *Immissionsschutzgesetz*, like our Clean Air Act,¹⁹⁵ authorizes the limitation of lead and other components of vehicle fuels that either "cause air pollution or interfere with the control of air pollution," a separate statute prescribes the only existing limits, and they serve only the former purpose; the *Bundesregierung* has said without explanation that West German gasoline will not in the foreseeable future be made clean enough, as ours is, to permit the use of noble metal catalysts for exhaust gas control.¹⁹⁶ Moreover, the all-import-

¹⁹⁰ STELLUNGNAHME DES BUNDESRATES, Entwurf eines Gesetzes zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge—Bundes-Immissionsschutzgesetz (opinion of the *Bundesrat* on the draft of a law for protection against harmful environmental effects from air pollution, noise, vibrations, and similar occurrences—federal environmental protection law), BTDRUCKS. 7/179 at 52, 56 (W. Ger. 1973).

¹⁹¹ See D. CURRIE, *supra* note 22, § 2.51.

¹⁹² Dritte Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung über Schwefelgehalt von leichtem Heizöl und Dieselmotorkraftstoff) (third regulation for the implementation of the federal environmental protection law—regulation concerning the sulfur content of light heating oil and diesel fuel) of Jan. 15, 1975 [Dritte Bundes-Immissionsschutzverordnung—3. BImSchV] (third federal environmental protection regulation), 1975 BGBl I 264 (W. Ger.), reprinted in BUNDES-IMMISSIONSSCHUTZGESETZ, *supra* note 2.

¹⁹³ Zehnte Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Beschränkungen von PCB, PCT und VC) (tenth regulation for the implementation of the federal environmental protection law—limitations on PCB, PCT, and VC) of July 26, 1978 [Zehnte Bundes-Immissionsschutzverordnung—10. BImSchV] (tenth federal environmental protection regulation), 1978 BGBl I 1138 (W. Ger.), reprinted in BUNDES-IMMISSIONSSCHUTZGESETZ, *supra* note 2.

¹⁹⁴ IMMISSIONSSCHUTZBERICHT, *supra* note 53, at 23.

¹⁹⁵ 42 U.S.C. § 7545(c)(1) (Supp. III 1979).

¹⁹⁶ Gesetz zur Verminderung von Luftverunreinigungen durch Bleiverbindung in Ottokraftstoffen für Kraftfahrzeugmotore (law for the reduction of air pollution by lead com-

tant emission standards for vehicles themselves have been adopted, as contemplated by section 38, under a separate traffic law.¹⁹⁷ The vehicle standards were reported by 1975 to have reduced emissions of carbon monoxide by sixty percent and of hydrocarbons by forty percent; they are evidently less strict than the American standards, to which, the *Bundesregierung* hopes, they will conform by 1982.¹⁹⁸ The *Bundesregierung* recently procured the enactment of a new statute authorizing regulation of chemicals, partly on the ground that the provisions of section 35 relating to composition of materials did not require reporting or testing.¹⁹⁹

In short, the *Bundesregierung* has a wide arsenal of powers for dealing with pollution sources at the stage of their creation, but one cannot understand the whole picture without considering sources of authority outside the *Immissionsschutzgesetz*.

VI. EMERGENCY PROVISIONS

Two sections empower the *Länder* to take extraordinary measures to avoid harm in areas where special risks are presented during periods of poor air circulation: under section 40, traffic may be restricted, and under section 49(2), polluting fuels may be prohibited or operating hours of facilities limited. The question arises why the allowable emergency measures are defined so narrowly. Those authorized may be the ones most commonly appropriate, but it seems preferable to provide for whatever measures might prove necessary and reasonable to avoid serious harm. This seems to be the effect of the Clean Air Act provision authorizing injunctions against polluting sources under similar circumstances.²⁰⁰

Unfortunately, the *Länder* are only authorized and not required to take action in a pollution emergency; in accordance with the general principle that federal laws are administered by the *Länder*,²⁰¹ the federal government is not authorized to act at all.

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pounds in fuel for Otto-cycle motor vehicle engines) of Aug. 5, 1971 [Benzinbleigesetz—BzBlG] (leaded gas law), 1971 BGBl I 1234 (W. Ger.), amended by Gesetz zur Ergänzung des Benzinbleigesetzes (supplementary leaded gas law), 1975 BGBl I 2919 (W. Ger.).

¹⁹⁷ Strassenverkehrsgesetz (traffic law) of Dec. 19, 1952, 1952 BGBl I 837 (W. Ger.), as amended by Gesetz zur Änderung des Strassenverkehrsgesetzes (traffic law amendment) of Apr. 6, 1980, 1980 BGBl I 413 (W. Ger.).

¹⁹⁸ IMMISSIONSSCHUTZBERICHT, *supra* note 53, at 23-24.

¹⁹⁹ *Id.* at 22.

²⁰⁰ 42 U.S.C. § 7603 (Supp. III 1979).

²⁰¹ See *supra* notes 125-26 and accompanying text.

From the American point of view, this arrangement seems an insufficient guarantee that adequate emergency measures will be taken.

VII. AREAS REQUIRING SPECIAL PROTECTION

A. Existing Law

Section 49(1) authorizes the *Länder* to adopt special regulations for regions "that require special protection" ("*die eines besonderen Schutzes . . . bedürfen*"). Apparently such regions include both those that are heavily polluted and those whose scenic or recreational values require air substantially cleaner than general ambient standards prescribe.²⁰² Under this section, the *Länder* may adopt measures to prevent harmful environmental effects that are "incompatible with the special protection requirement of these regions" ("*mit dem besonderen Schutzbedürfnis dieser Gebiete nicht vereinbar*"). In contrast to the requirements for subsequent orders in section 17, nothing is said in section 49(1) of either the state of the art or economic supportability; fortunately, it seems to be enough that the measures satisfy the proportionality principle.²⁰³ As with the emergency provisions just discussed, however, the permissible types of regulations are unfortunately limited; restrictions on traffic and vehicle fuels, for example, are not mentioned. Other laws, such as those governing traffic generally, may provide the missing authority.

On paper, section 49(1) might appear to afford much of the protection for scenic regions given by the provisions of our Clean Air Act for preventing significant deterioration of areas now meeting ambient standards.²⁰⁴ In fact, section 49(1) exists only on paper, for no regions have been designated as requiring special protection.²⁰⁵ On reflection, this is hardly surprising, for the decision whether to implement section 49(1) is left entirely to the *Länder*, whose unwillingness to act individually was probably the reason, if our own experience is any guide, that the federal statute had to be

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²⁰² BEGRÜNDUNG DES GESETZENTWURFS, *supra* note 30, at 45; 1 G. FELDHAUS, *supra* note 27, at 5-6.

²⁰³ 1 G. FELDHAUS, *supra* note 27, at 7-8. Cf. *supra* notes 32-33 and accompanying text (section 5 duties similarly limited only by the general proportionality principle). On the proportionality principle generally, see *supra* note 34 and accompanying text.

²⁰⁴ 42 U.S.C. §§ 7471-7479 (Supp. III 1979), discussed in D. CURRIE, *supra* note 22, §§ 7.01-7.16.

²⁰⁵ IMMISSIONSSCHUTZBERICHT, *supra* note 54, at 25.

enacted in the first place. In the United States, the most important regions to be protected are designated by the statute itself,²⁰⁶ and the nondegradation program is a real one.

Although section 49(1) has been ineffective, several other provisions of the West German statute do afford some protection for areas that are now cleaner than ambient standards require. Regulations governing the production of machines and materials²⁰⁷ and technical or emission standards for nonpermit facilities²⁰⁸ apply everywhere, not just where ambient standards are about to be exceeded. In addition, the precautionary principle of section 5 may well require that new sources requiring permits employ state-of-the-art technology throughout the country. These measures help to preserve room for additional new sources, but they cannot prevent eventual degradation of clean areas to the level of ambient standards.

An interesting provision of the *TA-Luft* guidelines purports to afford additional protection to certain areas cleaner than ambient standards. Under that provision, permits are generally not to be granted if they would cause sulfur dioxide concentrations to exceed sixty micrograms per cubic meter in areas where that level previously has been met.²⁰⁹ As a nondegradation provision, this is an incomplete solution: it applies only to a single pollutant, and it does nothing for areas in which sulfur dioxide is between sixty micrograms per cubic meter and the ambient standard of 140.

The threshold question, however, is how this special sulfur dioxide guideline can be supported under the statute. Section 49(2) is no help, for it authorizes only the *Länder* to act, whereas the *TA-Luft* is a federal guideline. Section 48, under which the special guideline was purportedly adopted, authorizes only measures to carry out the statute and its regulations, and the sulfur dioxide guideline does not appear to implement any applicable provision. The guideline has been defended as defining the precautionary duty imposed by section 5,²¹⁰ but in fact it contradicts the precautionary principle, for precautions are supposed to preserve room for future industry,²¹¹ whereas the sulfur dioxide guideline prohibits new industry long before the space afforded by ambient stan-

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²⁰⁶ 42 U.S.C. § 7472(a) (Supp. III 1979).

²⁰⁷ BImSchG §§ 32-37.

²⁰⁸ *Id.* § 23.

²⁰⁹ TA-Luft § 2.4.3.

²¹⁰ 1 G. FELDHAUS, *supra* note 27, at 50-51.

²¹¹ See *supra* notes 83-91 and accompanying text.

dards has been exhausted. Finally, it seems difficult to justify the sixty-micrograms-per-cubic-meter limit as defining the section 5 duty to avoid environmental harm, for the same document elsewhere declares 140 micrograms per cubic meter a safe level. Though harmful concentrations may vary according to such factors as scenic value, it is hard to believe that the areas requiring special protection coincide exactly with those now meeting the sixty-micrograms-per-cubic-meter level.

B. The Nondegradation Proposal

The statutory amendments proposed in 1979 would have made compliance with the ambient standards determinative in most cases of the section 5 duty not to cause environmental harm.²¹² A new "degradation prohibition" (*"Verschlechterungsverbot"*), however, would have made satisfaction of ambient standards insufficient if "the existing complement of animals, plants, or other things (*Tiere, Pflanzen oder andere Sachen*) will be essentially harmed (*wesentlich beeinträchtigt*)" by a new facility outside a polluted area.²¹³

The label "degradation prohibition" is misleading to anyone familiar with the American experience. In this country, it is not necessary, as it would have been under the West German proposal, to demonstrate that the new facility would cause actual harm to bring it within the nondegradation provisions; part of the reason for those provisions is a lack of confidence that we really know what concentrations, if any, are harmless.²¹⁴ In fact, the West German proposal would have served not to preserve existing clean air as such, but only, like the American "secondary" ambient standards,²¹⁵ to prevent demonstrable harm to the public welfare. Indeed, the proposed clause fell short even of our secondary standards, for it would not prevent all actual harm. It would have applied only to facilities constructed outside areas already polluted, yet there are animals, plants, and other things *within* polluted areas, too, and in the United States they must be pro-

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²¹² Entwurf eines Zweiten Gesetzes, *supra* note 47, art. 1, sec. 3(a), § 6a(1), BTDrucks. 8/2751, at 4; *see supra* note 47 and accompanying text.

²¹³ Entwurf eines Zweiten Gesetzes, *supra* note 47, art. 1, sec. 3(a), § 6a(1)(2), BTDrucks. 8/2751, at 4; BEGRÜNDUNG DES ZWEITEN GESETZENTWURFS, *supra* note 74, at 7-8.

²¹⁴ H.R. REP. NO. 294, 95th Cong., 1st Sess. 110-12 (1977).

²¹⁵ 42 U.S.C. § 7409(b)(2) (Supp. III 1979).

tected.²¹⁶ In addition, emissions from facilities in polluted areas can cause damage in areas now clean.

Furthermore, the proposal would have authorized the *Länder* to allow new facilities even in clean areas to cause environmental harm, either by finding "an overriding public interest" ("*ein überwiegendes öffentliches Interesse*") in the individual case or by designating an entire area as a "development region" ("*Entwicklungsgebiet*").²¹⁷ In other words, it would have been entirely up to the *Länder* whether animals, plants, and other things were to be given any protection at all.

Finally, it seems questionable whether the proposed nondegradation clause would have added anything to the protections afforded by present law. Section 5 already forbids issuance of a permit for a facility that would cause environmental harm, and environmental harm is defined in section 3 to include damage to "persons as well as animals, plants, or other things." In other words, under the statute as it now stands, *any* harm to animals, plants, or things requires denial of the permit; far from making the law more stringent, the proposal would appear to relax existing requirements.

Yet the proposed amendment was touted as affording additional protection. If it did, it can only mean that existing ambient standards were set at levels adequate to protect only human health;²¹⁸ if this is the case, the *TA-Luft* does not adequately effectuate the command of section 5. In short, the best that can be said of the so-called nondegradation proposal is that it might have been an improvement over a present failure to carry out existing law.

CONCLUSION

What first strikes the American observer are the enormous similarities between the West German air pollution law and our own. Both rely heavily on requiring permits for important new sources of pollution, and both appear to subject such sources to a best-technology requirement. Both place particular emphasis on ambient standards defining safe concentrations. Both require comprehensive plans for implementing those standards, and they have

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²¹⁶ *Id.* § 7410.

²¹⁷ Entwurf eines Zweiten Gesetzes, *supra* note 47, art. 1, sec. 3(c), § 6c, BTDRUCKS. 8/2751, at 5; *id.* sec. 9, § 49a, BTDRUCKS. 8/2751, at 5.

²¹⁸ The *Bundesregierung* so suggested in proposing the statutory amendment. See BEGRÜNDUNG DES ZWEITEN GESETZENTWURFS, *supra* note 74, at 7-8.

developed substantially identical provisions allowing new sources in polluted areas. Both limit emissions from new vehicles and regulate the content of vehicle fuels; both authorize special measures for pollution emergencies and for scenic areas.

Some similarities are to be expected, for the problems of air pollution are similar in all industrial countries. But the similarity between West German and American air pollution laws goes beyond what is inherent in the nature of the problem. The issues posed by air and water pollution are also similar, yet our Clean Air Act differs more from our Clean Water Act²¹⁹ than from the *Bundes-Immissionsschutzgesetz*, not least in the emphasis it places on ambient standards.

Closer inspection reveals, however, that the West German law affords significantly less protection against air pollution than does the American. West German standards for ambient air quality and for vehicle emissions seem less stringent than ours; the problem of photochemical smog is largely ignored; implementation plans have no legal force, and few have been adopted. Ambient standards may be met, as North Rhine-Westphalia proposes, by building stacks without reducing emissions. Sources with existing permits may be ordered to meet ambient standards only if they can continue to make a good profit, and permits can be revoked only if compensation is paid to the owner. Emergency measures are limited. There is no true nondegradation requirement, and no scenic areas have been designated for the limited protection the statute allows. Many important policy questions, as well as the general task of enforcement, are left to the *Länder*, which are under competitive pressure to permit pollution.

In other respects, the West German law is preferable to the American. All air pollutants must be considered, not just those for which numerical standards have been issued. More regulatory authority is granted at the production stage for equipment or materials that later may pollute. Many pollutants that we treat only under general particulate standards have been subjected to emission limitations based upon their particular toxicity. The proportionality principle should ensure that expenditures for pollution control bear a reasonable relationship to their benefits. Finally, and of some importance in reducing the public and private costs of administration, the West German example demonstrates that it is

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²¹⁹ 33 U.S.C. §§ 1251-1376 (1976 & Supp. III 1979).

unnecessary that a pollution statute be nearly 200 pages long.

A recent West German survey reveals little dissatisfaction with the adequacy of the *Bundes-Immissionsschutzgesetz*, but concludes that it is not being enforced adequately, essentially because of insufficient personnel and equipment.²²⁰ Complaints of inadequate enforcement are not unknown in America, but the lack of personnel in West Germany seems considerable. In the entire *Land* of Hessen, for example, which includes the major city of Frankfurt, three officials with two or three assistants each are charged with enforcing the water pollution laws.²²¹ If the air pollution situation is comparable, the enforcement problem is serious.

An outsider is always on shaky ground in attempting to understand and to criticize a law as complicated as the *Bundes-Immissionsschutzgesetz*. Yet the comparison can be quite rewarding. In this case, the comparison shows above all how similarly two countries with quite disparate legal traditions have reacted to a common problem.

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²²⁰ R. MAYNTZ, *VOLLZUGSPROBLEME DER UMWELTPOLITIK passim* (1978).

²²¹ Interview with pollution-control officials of the *Land* Hessen, in Darmstadt, W. Ger., July 1980.