

FINDINGS AND DECISION
OF THE HEARING EXAMINER FOR THE CITY OF SEATTLE

In the Matter of the Appeal of

INTERNATIONAL BROTHERHOOD OF
ELECTRICAL WORKERS (I.B.E.W.)
LOCAL NO. 46

FILE NO. W-87-004

RECEIVED

from an environmental determination
of DCLU

JAN 18 1988

Introduction

OFFICE OF HEARING EXAMINER

Appellant challenges the determination of nonsignificance issued by the Department of Construction and Land Use, for proposed local amendments to the 1987 National Electrical Code.

The appellant exercised the right to appeal pursuant to Section 25.05.680, Seattle Municipal Code.

Parties to the proceedings were: appellant, I.B.E.W., by Law Offices of J. Richard Aramburu, Jeffrey M. Eustis; Respondent DCLU by the City Attorney, Gordon Crandall, assistant; and Respondent/intervenor Carlon Division of Lamson & Sessions Co. by Riddell, Williams, Bullitt & Walkinshaw, Patrick D. McVey and Robert I. Heller.

This matter was heard before the Hearing Examiner on October 14, December 1, 2, 3, 10, 11, and 15, 1987.

Unless otherwise indicated, section references are to the Seattle Municipal Code.

After due consideration of the evidence elicited during the public hearing, the following findings of fact and conclusions shall constitute the decision of the Hearing Examiner on this appeal.

Findings of Fact

1. The proposed action is the adoption of the 1987 National Electrical Code ("NEC") with local amendments. The Department of Construction and Land Use ("DCLU") is the lead agency. DCLU issued a determination of nonsignificance ("DNS") for the proposed action. The International Brotherhood of Electrical Workers ("I.B.E.W") No. 46 filed a timely appeal of the DNS.

2. Article 331 of the current electrical code allows electrical nonmetallic tubing ("ENT") in wet locations. The proposed amendment would also allow the use of ENT, outside of the Downtown and Central Waterfront Fire Districts, in walls, floors and ceilings where there is a thermal barrier with at least a 15 minute finish rating.

3. Article 347 of the NEC addresses rigid nonmetallic conduit ("rigid PVC"). Under the current code the rigid PVC is allowed in concealed walls, floors and ceilings where encased in at least two inches of concrete, outside of buildings, in wet locations, in cinderfill and where subject to corrosive conditions. The amendment would affect structures not located in the Downtown or Central Waterfront districts and allow the use of rigid PVC without concrete both inside and outside buildings. For special occupancy buildings such as hospitals, nursing homes and large residential treatment facilities, etc., rigid PVC raceways would be permitted only outside the building or in the earth or in concrete.

4. Seattle's electrical code has been more conservative than the NEC in the past as to PVC. In the 1984 Seattle code, ENT was not allowed where it was in the NEC. After the amend

ments to the 1987 NEC, it would still be more restrictive than the NEC in that the new uses for ENT and rigid PVC conduit would not be permitted in the two fire districts.

5. Seattle's Uniform Building Code permits the use of plastic veneer within buildings. The date of its inclusion was not provided.

6. In 1987, Seattle adopted the Uniform Plumbing Code with amendments which authorizes the use of PVC and certain other plastic water pipe and tubing for hot and cold water distribution within a building, and for a waste and vent piping in noncombustible buildings.

7. The NEC is the result of a process where proposals for amendments are submitted to the National Fire Protection Association ("NFPA") which may accept or reject the proposals. Then technical reports are submitted and the public may comment. Following that, comments are considered and the proposed code is published. When ENT was proposed for electrical raceway use in the 1984 amendment cycle, an advisory commission on toxic products of combustion ("TAC") was created to review the proposed Article 331. A three-story height limitation was included. In the 1987 cycle the TAC considered the modification of Article 331 to allow ENT in concealed spaces and remove the three floor restriction. After taking evidence it decided modification was appropriate. A metallic conduit manufacturer appealed the conclusion. The appeal was denied and a further appeal to the NFPA Board of Directors was denied.

8. The local amendments were drafted by the DCLU staff after a review of the NEC. Then the Electrical Code Advisory Board met over a period of six months to review the proposed amendments. The advisory group had representatives of electrical contractors, general contractors, architects, developers, labor, electrical engineers and manufacturers groups along with members of the public. Fire Department and City Light representatives were ex officio members without vote.

9. The environmental checklist ("checklist") was prepared by Dave Cordaro, DCLU code research assistant, who served as staff member to the advisory group. The checklist was reviewed by Cliff Portman, DCLU land use project manager, in less than one half hour. He had discussed with Cordaro the proposed action and issues and concluded the checklist appropriately represented the impacts.

10. Polyvinyl chloride conduit has been produced by Carlon since the early 1960's for sale in the United States. Prior to that it was used extensively in Europe. Rigid conduit has been included for use in the NEC since the late 60's or early 70's. Carlon has produced over three billion feet of rigid PVC conduit and 150 million feet of ENT for sale in the United States.

11. Polyvinyl chloride (PVC) is a synthetic polymer. Vinyl chloride a monomer of PVC and a carcinogen. While there was a period when residual amounts of the monomer were present in levels high enough to cause a health risk, those levels have been greatly reduced. Though one part per million in the air for eight hours of exposure is permitted under OSHA standards, the level now present in PVC is too low to be measured.

12. Hydrogen chloride gas is the chief product of the thermal decomposition of PVC. At low temperatures trace amounts of alephatic hydrocarbons, perhaps vinyl chloride and additives are given off. At higher temperatures, after the hydrogen chloride is exhausted, the decomposition products are both alephatic and aromatic hydrocarbons.

13. Hydrogen chloride gas is an irritant. At high levels of concentration it can cause death in humans by irritating the respiratory membranes and causing pulmonary edema. Those levels are believed to be 1,000 - 2,000 ppm in short exposures. Exhibit 74.

14. Workers using PVC conduit connect sections at the job site with cement. Carlon produces one called "Quick-set" Cement. The ingredients, described as "hazardous" on the label, are methyl ethyl ketone, tetrahydrofuran, cyclohexanone and acetone. Exhibit 30. These are all ingredients commonly found in solvents.

15. If the skin is exposed to solvents there may be irritation. Inhaled fumes from solvents have the potential to affect the central nervous system in the same way alcohol does such as affecting coordination, slowing the reaction time and slurring the speech and the affect disappears with time away from the fumes. With long term exposure, most solvents will eventually affect the kidneys and liver.

16. OSHA limits the concentration of methyl ethyl ketone and acetone in the workplace and will require changes in work practices, such as ventilation or respirators, where it finds the limits exceeded.

17. The surroundings where electricians use the cement vary from open shells in new construction where ventilation is excellent to closed crawl spaces in old buildings with virtually no ventilation. Witnesses described experiences from 1 to 3 hours in a crawl space for a building with four units on the bottom floor to six months doing conduit full time in a downtown office building. The cement is with the worker at all times while doing this work but the cap is replaced immediately after use. Nevertheless, workers in confined areas commonly get a "buzz" from the exposure.

18. Contact with the skin occurs when cement drops onto workers from above or the worker uses his or her fingers to remove the excess rather than using a cloth or gloves.

19. Tools are available for cutting rigid PVC conduit and ENT. When these tools are used, no dust is created. Witnesses report that rigid PVC conduit is also cut with hand saws and, on occasion, power saws have been used. Some dust may be created when hand saws are used and will be when power saws are used. The conduit is generally cut nearby the place the worker is installing it.

20. Dust from PVC is an inert or nuisance particulate. The particles are generally too large to get past the upper respiratory tract but some may be within respirable range. Department's witness Peters, an industrial hygienist, testified that if the dust does get into the lung it is dumped into the digestive system and passes through the body without effect. Appellant's witness Schumacher, also an industrial hygienist, testified that if the particle gets into the lung, residual vinyl chloride could be emitted. He says there is some uncertainty about the affect of PVC dust citing the statement of Karstadt that:

The affect of locally high concentrations of PVC particles carrying minute amounts of potentially leachable RVC or additives merits investigation, especially as concerns contact with lung or liver tissue.

Exhibit 69, p.114. This concern is directed to the population of workers in polymerization plants where workers are drying and bagging resin or mixing areas, etc., in fabrication facilities where high concentrations of the dust may be present. Dust from cutting conduit at a construction site would be unlikely to reach that level of concentration.

21. Electricians must bend rigid PVC conduit in the course of installation. Heat is applied with a heating blanket, a heat box or a "bazooka" unit or torch. Frequently, the pipe is left too long and the PVC begins to decompose. The smoke given off contains hydrogen chloride gas. Workers will generally avoid the smoke by moving the smoking pipe outdoors or moving away from the smoke but some smoke may be inhaled.

22. An 18 to 30 inch piece of rigid PVC burned for ten minutes in an 8 by 10 by 12 ft. room approaches the level of 1,500 ppm, according to Dr. Alarie. Exhibit 74. His method and the calculations used to extrapolate the results from mice to humans are criticized by Dr. Packham. Exhibit 70.

23. PVC ignites between 815 and 1,035 degrees Fahrenheit. Destructive distillation may begin as low as 167 degrees Fahrenheit.

24. When PVC is heated a strong odor of chlorine is given off.

25. Hydrogen chloride is a very reactive gas and it tends to adsorb onto surfaces like walls and soot particles and it decays very rapidly. The concentration of the gas in the air depends upon the type of surfaces which affect how much is adsorbed, the amount of water vapor present, the mix of fresh air and the aerodynamics of any particles to which it is attached. Other combustion gases do not decay.

26. The smoke from burning rigid PVC is ten times as dense as that from red oak. The density makes fire fighting and rescue more difficult.

27. Researchers have found that phosgene gas can be generated in the thermal decomposition of polyvinyl chloride using an electrical arc. Exhibit 76. Studies of the effects on animals of decomposition of PVC due to arcing had not been done as of the date of Exhibit 76 and no other evidence as to those effects was adduced.

29. With the increase in use of plastics in building interiors, the smoke in building fires has become more toxic. Regulations now require firefighters to wear breathing devices for all operations.

30. Of the large loss fires (those over one million dollars in property damage) 36 percent of the fires on mercantile properties (which represent 18 percent of the large loss fires) and 26 percent of fires on manufacturing properties (25 percent of the large loss fires) involved electrical equipment or wiring. Exhibit 7. In residential fires, the most common causes are careless smoking, cooking, heating and electrical problems.

31. When fire starts in a room, rather than within a concealed space, occupants would have vacated the room or have died due to heat stress or inhalation of carbon monoxide before PVC is involved. A furnished residential room can be expected to go to flash over in three minutes.

32. The combustible materials now within a wall cavity may include insulation, plastic vapor barrier, plastic plumbing and lumber.

33. The likelihood of a fire starting in a concealed space because of an electrical fault in a PVC raceway is remote. A third wire provides a ground to take the electricity back to the source. There can be a short only if the insulation is breached on two conductors at approximately the same location. Then if arcing occurs, the circuit breaker would be tripped cutting off the current. Only if the circuit breaker fails to function properly would the PVC be ignited.

34. PVC will not continue to burn if the source of heat or flame is removed.

35. Fires which have originated in concealed spaces make up a very small percentage of the total fires.

36. The use of PVC raceways provide two measures of protection against ground faults in that the nonmetallic wall does not ground and there are two layers of insulation separating the energized conductors from possible grounds.

37. Combustion products in concealed spaces can migrate to other areas through defective fire stops.

38. As high as 80 percent of fire fatalities are caused by inhalation of combustion products. Examples were given by appellants, such as the MGM Grand fire in Las Vegas where the fatalities were far removed from the fire itself, and the Westchase Hilton Hotel fire in Houston where there were no fatalities in the room with the fire but occurred elsewhere.

39. There are differences of opinion as to the cause of death of the victims of the MGM Grand fire. The Medical Examiners Office concluded that most were the result of smoke and carbon monoxide inhalation. Dr. Esch and Hunter concluded, after toxicological studies, that 16 victims died due to the inhalation of corrosive gases, not carbon monoxide. Exhibit 79.

40. The fuel load for the MGM Grand fire was synthetic furnishing and interior finishes including large amounts of polyurethane foam. Exhibit 79.

41. In the Westchase Hilton fire where the fire occurred in one room and fatalities elsewhere, carbon monoxide was identified as the cause of most deaths and hydrogen cyanide two deaths. Dr. Birky found evidence of damage from hydrogen chloride in some of the victims and believes it was a contributor. Exhibit 15.

42. In at least 50 percent of fire-related deaths, carbon monoxide is the cause. It is believed to be a major contributing factor in another 30 percent. Exhibit 70.

43. Whether hydrogen chloride is a contributor to reported fire fatalities is uncertain since it is difficult to measure inhaled hydrogen chloride.

44. Appellant cited no example of fires where it has been determined conclusively that the origin was in a PVC raceway. The origin of the fire at Ray's Boathouse is inconclusive. At this time it is believed to have been caused either by an electrical fault within a PVC raceway or in the heat tape.

45. Carlon has never received a claim that its PVC products contributed to the cause or spread of fire.

46. Appellant's witness Philbin estimates that plastics comprise as much as 20 percent of building materials today. He expects the trend toward increasing use of plastics to continue.

47. The proposed amendments to the NEC substituting PVC conduit and ENT for metallic tubing would add .5 to 2 percent to the fuel load of an 8-unit building.

Conclusions

1. An environmental impact statement (EIS) is required for major actions significantly affecting the quality of the environment. Section 25.05.330. As a threshold determination, the responsible official is to "determine if the proposal is likely to have a probable significant adverse environmental impact...." Section 25.05.330A.2. If the official reasonably believes that it may, then an EIS is required. Section 25.05.330D. If the official determines there will be no probable significant adverse impact, then a DNS is to be issued. Section 25.05.340A.

2. Appellant adduced evidence intended to show adverse impacts on worker health and safety from the use of the products permitted by the proposed amendments on fire fighters, occupants and others from the release of gasses in case of fire and from the added risk of fire. Respondents contend that some of the impacts addressed by appellant's evidence do not affect the "environment." As defined by SEPA

"Environment" means, and is limited to, those elements listed in Section 25.05.444, as re-

quired by RCW 43.21C.110(1)(f). Environment and environmental quality refer to the state of the environment and are synonymous as used in these rules and refer basically to physical environmental quality.

Section 25.05.740.

3. Elements of the environment listed in Section 25.05.444 which are affected, according to appellant, are A.2.a. Air Quality under the natural environment; B.1.b. Risk of explosion, B.1.c. Releases or potential releases to the environment affecting public health, such as toxic or hazardous materials and B.4.a. Public services and utilities: Fire, all in the built environment.

4. The lead agency is to evaluate the responses in the checklist along with other information furnished to make its threshold determination. Section 25.05.330. The checklist questions which relate to the elements of the environment cited by appellant are:

B.2.a What types of emission to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

c. Proposed measures to reduce or control emissions or other impacts to air, if any.

7.a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so describe.

1) Describe special emergency services that might be required.

2) Proposed measures to reduce or control environmental hazards, if any.

15.a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so generally describe.

Section 25.05.960. These questions are intended to aid the responsible official in making the threshold determination. Section 25.05.315. Since the same agency which established the list of elements of the environment, the Department of Ecology ("DOE"), developed the checklist, RCW 43.21C.110, those questions provide some indication of the intended scope of element.

5. Dust and emissions during construction could be shown to affect air quality. The environmental health element has been interpreted by DOE to have a broad scope which includes risk of fire and exposure to toxic substances. Impacts on public services are those creating an increased need. Therefore, a significant adverse impact on the environment could be shown in the form of reduced air quality, increased risk of fire, exposure to toxic substances, or increased need for fire protection.

6. For an EIS to be required, appellant must show the adverse environmental impact to be "probable". "Probable" is defined for this propose as "...likely or reasonably likely to occur..." "'Probable' is used to distinguish likely impacts from those that merely have a possibility of occurring, but are remote and speculative." Section 25.05.782.

7. Appellant cites cases under NEPA where federal courts

have required EIS's when the chance of occurrence was not great but the effect, if it occurred, would be catastrophic to the environment. Since none of the effects of the use of PVC, even at worst case, were shown to be catastrophic, those cases are inapposite here so probability must be shown.

8. Appellant also urges use of the "substantial question" standard, i.e., "whether the plaintiff has alleged facts which, if true, show the proposed project may significantly degrade some human environmental factor." Foundation for North America Wild Sheep v. the United States Department of Agriculture, 681 F.2d 1172, 1177-1178 (9th Cir. 1982) (emphasis in original). Appellant suggests that Section 25.05.080B supports the application of the substantial question standard.

When there are gaps in relevant information or scientific uncertainty concerning significant impacts, agencies shall make clear that such information is lacking or that substantial uncertainty exists.

Even when there is scientific uncertainty, however, there is no requirement that an EIS be prepared as is shown by the provisions following which allow the agency to proceed on the action with disclosure of a worst case scenario. Section 25.05.080.C. The definition of "probable" in SEPA is the test to be applied in Seattle and that conforms to the Norway Hill standard requiring a reasonable probability. Norway Hill v. King County Council, 87 Wn.2d 267, 552 P.2d 674 (1976).

9. The impact also must be shown to be significant to require that an EIS be prepared. "Significant" is defined in SEPA as "a reasonable likelihood of more than a moderate adverse impact on environmental quality." Section 25.05.794.A. The definition goes on to explain that both context and intensity are involved in significance, and that severity and the likelihood of occurrence are to be assessed together.

10. The evidence showed no effect on air quality from solvent fumes, dust or combustion products generated during the installation of ENT and rigid PVC conduit beyond the immediate room or structure involved or for more than a brief time in those surroundings. Therefore, no significant effect on environmental air quality has been established. If the air quality in individual rooms and the effect on individuals within those rooms could be considered under SEPA, the showing of minor intoxication or irritation would be insufficient to establish a significant impact.

11. The evidence shows no probable increase in the chance of fire due to the use of PVC products as allowed by the amendments. While combustible, the product itself was not shown to cause fires and the history of its use in other areas of the country and world without complaint was sufficient to justify the conclusion that risk would not be increased.

12. The addition to the fuel load of the building due to the substitution of a combustible product for a noncombustible one would not add to the risk of fire, but if it is seen to, the increment is too small to be significant.

13. As to environmental health hazards from exposure to toxic or hazardous materials released to the environment, releases could occur in installation and in the event of building fires. That there will be fires in buildings in which the permitted PVC products would be used is probable. In installation the exposure time and concentration to fumes or combustion products was not shown to be significant. Since some of the combustion products of PVC are irritants or toxic, the substitution of PVC for noncombustible metallic conduit could potentially impact environmental health if the PVC is burned and is decomposed in building fires. Again, appellant must prove that the environmental impact from release of these toxic or hazardous materials would be probable and significant. Since the

PVC raceways would be concealed and only a small portion of fires start in concealed spaces, in most cases injury or death would occur from fire stress or carbon monoxide before the PVC material would be affected.

14. If the gases travel to areas where there are occupants who were not affected by the heat or carbon monoxide or if the fire occurred in a concealed space, there would be potential for injury from the decomposition of the PVC. The record does show the potential for migration of smoke and other decomposition products through defective fire stops and through outlets and other orifices into occupied areas. The record does not establish that sufficient quantities of hydrogen chloride gas would be transported given, its reactive nature, nor that hydrogen chloride gas has been the cause of injury or death in the major fires discussed. Further, since hydrogen chloride gas has a strong odor, occupants are likely to leave areas affected by smoldering PVC unless overcome by carbon monoxide or other toxicants. Firefighters would not be affected by the combustion products because they now use breathing devices.

15. The substitution of a product with harmful products of combustion for a noncombustible does not lead to a significant impact given the context of buildings, rooms or concealed spaces filled with other synthetics and the small increment involved.

16. Increased need for fire services was not shown.

17. Though the time spent reviewing the checklist by the DCLU analyst was brief, the analyst was entitled to give some weight to both the NEC and local amendment process which involved review by persons with various interests and knowledge of the safety issues involved.

18. Appellant suggests the examiner should infer from the exclusion of the more dense Downtown and Waterfront Fire Districts that there are unanswered questions about the hazard involved in the use of PVC conduit. No reason for exclusion of those fire districts was established in the record other than that the City's historic conservative approach. Moreover, those area's exclusion makes the likelihood of a significant impact from the use of the materials less likely simply because fewer buildings are affected.

19. Even if there remain questions about hazard, appellant bears the burden of proving that the decision by the lead agency to proceed without an EIS is clearly erroneous. Section 25.05.680B.3. Brown v. Tacoma, 30 Wn.App. 762 P.2d 1005 (1981). After reviewing the entire record the examiner does not have a firm conviction that mistake has been made.

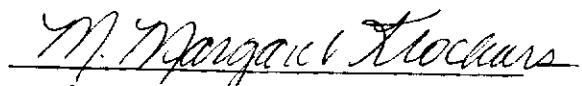
20. Appellant urges that the proposed amendment to the NEC should be treated as a similar action to the changes that have been made to the Uniform Plumbing Code and Uniform Building Code in the past under Section 25.05.060. That provision allows proposals that are related closely enough to each other to be a single course of action may be evaluated together. The provision is clear that the agencies are not required to analyze similar actions and where, as here, the timing is different, it would not be possible.

21. Appellant has not shown a probable significant adverse impact on the environment from the proposed amendments so the determination should be affirmed.

Decision

The determination of nonsignificance is affirmed.

Entered this 8th day of January, 1988.


M. Margaret Klockars
Deputy Hearing Examiner

CONCERNING FURTHER REVIEW

Judicial review under SEPA shall without exception be of the decision on the underlying governmental action together with its accompanying environmental determinations. RCW 43.21C.075(6)(c). SEPA issues may be added to the request for review of the underlying decision within 30 days after the date of official notice of that decision if a notice of intent to seek judicial review of SEPA issues is filed with the Director, Department of Construction and Land Use, 400 Municipal Building, Seattle, Washington 98104, with the time limit set for appealing the underlying governmental action. Seattle Municipal Code Section 25.05.680(D)(4).

If the Superior Court orders a review of the decision, the person seeking review must arrange for and bear the cost for preparing a verbatim written transcript of the hearing but will be reimbursed if successful in court. Instructions for preparation of the transcript are available in the Office of Hearing Examiner, 400 Yesler Building, Seattle, Washington, 98104. In the alternative, RCW 43.21C.075(6)(b) provides that a tape may be used for the court review. If a taped transcript is to be reviewed by the court the record shall identify the location on the taped transcript of testimony and evidence to be reviewed. Parties are encouraged to designate only those portions of the testimony necessary to present the issues raised on review, but if a party alleges that a finding of fact is not supported by evidence, the party should include in the record all evidence to the disputed finding. Any other party may designate additional portions of taped transcript relating to issues on review.