for most industrial process refrigeration equipment. Leaks will occur to some extent in locations such as threaded connections, valve packing, compressor shaft seals and flange seals. Industrial process refrigeration equipment contains many of these potential leak sources, many of which may not be directly accessible because they are packed in ice or insulation. These seals typically depend upon a polymer or other flexible material that is compressed between smooth metal surfaces to form a seal. A perfect seal is virtually impossible. Therefore, all such seals will have a small leak rate. Scratches on the metal surface, dirt at the sealing surface, embrittlement, abrasion/deformation from shaft rotation and valve manipulation, or gradual extrusion, deformation of the polymer under temperature cycling and pressure could all increase the leak rates. Leaks may also occur anywhere in the system where corrosion or metal fatigue can cause mechanical failure. If the refrigeration system operates under pressure, the refrigerant may be lost by direct leakage. If the system operates at less than atmospheric pressure, that is under partial vacuum, then noncondensable gases will be drawn into the system and small amounts of refrigerant may be lost when these noncondensables are vented through the purge valve.

Industrial process refrigeration systems have many potential sources of leaks. If a sufficient number of other leaks can be repaired creating a situation where the originally identified leak or leaks remain, but the overall leak rate has been successfully reduced to below 35 percent per year, EPA believes that the owner or operator of the facility has still in effect met its obligation under the rule.

EPA is more concerned with the percent of refrigerant being released than the actual source of the refrigerant leaked. Therefore, EPA is proposing that the owner or operator of an industrial process refrigeration unit be relieved of the obligation to retrofit or replace the equipment if, within 180 days of the failed dynamic verification test, the owner or operator establishes that the system's annual leak rate does not exceed 35 percent. If the equipment owner or operator establishes that the system's annual leak rate does not exceed 35 percent, the owner or operator would be required to notify EPA within 30 days of that determination and the owner or operator would no longer be subject to the obligation to retrofit or replace the equipment that arose as a consequence of the initial failure to repair the leaks

successfully. The determination of whether the system's annual leak rate exceeds 35 percent would be determined in accordance with parameters identified by the owner or operator in its notice to EPA regarding the failure of the initial dynamic verification test discussed above.

EPA believes that this scheme for treating a failed dynamic test provides an appropriate level of flexibility for the affected community. Industrial process refrigerant equipment owners or operators would be required to retrofit or retire the system, unless a second attempt to repair the leaks is successful, or another method for achieving a leak rate of less than 35 percent per year can be achieved within the limited timeframes discussed above. Furthermore, the owners or operators would be required to maintain records and report information to EPA so that the Agency can establish that a viable approach is being followed by the owners or operators of the affected facilities.

EPA requests comments on this proposed scheme for allowing a flexible approach to be used by the owners or operators of industrial process refrigerant equipment that have failed a dynamic test. EPA also requests comments on ways in which to simplify or make more clear the differences between when a static or dynamic test is appropriate, or if other terminology would provide greater clarity.

## *G.* Clarification of Levels to Which Leaks Must be Repaired Leak Rate

Through this action, EPA is also proposing a clarification to § 82.156(i) (1) and (2). As a part of the settlement agreement, EPA agreed that for industrial process and commercial sources, leaks needed to be repaired such that the leak rate was brought back to a level below the 35% annual rate. EPA believes that parallel clarification for comfort-cooling and commercial sources will provide equitability, rather than requiring a repair of "all" leaks for comfort-cooling systems.

As discussed above, EPA is proposing to revise the requirements for industrial process refrigeration equipment currently under § 82.156(i)(1) to require the owners and operators of this equipment to reduce leaks to a rate of less than 35 percent per year. However, EPA would allow these affected systems to operate as long as the leak rate does not exceed that amount. Therefore, EPA believes it is appropriate to also revise the regulations regarding commercial and comfort-cooling equipment to provide that the obligation to repair leaks triggered by an exceedance of the leak rate is an obligation to repair all leaks sufficient to bring the leak rate below 35% and 15%, respectively, per year, rather than to bring the leak rate down to zero.

Therefore, EPA proposes to clarify that in repairing leaks on equipment subject to the 15% leak rate, one must bring leaks down below the 15% threshold in order to comply and in repairing commercial refrigeration equipment, one must bring leaks down below the 35% threshold in order to comply. While it may be less difficult to locate and repair leaks found in comfort-cooling and commercial refrigeration appliances, to some extent, many of these systems may also contain leak sources that can be difficult to locate and repair. This may be particularly true for certain types of commercial refrigeration appliances.

EPA requests comment on the proposed modification to the current language in  $\S$  82.156(i)(1) and (2).

## H. Extension for Retrofitting a Facility

EPA believes that it may be reasonable to permit additional time beyond the one year established by the current regulations for the retrofitting of certain industrial process refrigeration equipment. EPA believes there are specific concerns relating to the need for special design, engineering, ordering and installation difficulties for some industrial process refrigeration equipment. It may take weeks or in some cases months to determine available options and develop specifications before it is possible to design a retrofitted facility and subsequently install the equipment. Even when special design plans are not necessary and the repairs may appear simple, the uniqueness of these large systems may dictate that new or replacement parts cannot be obtained in time to meet either 30-day repair requirement or the one-year retrofit deadline.

Parts for other types of systems, such as comfort-cooling, are more likely to be mass-produced, widely distributed, readily transportable and capable of quick installation. Parts for industrial process refrigeration equipment are often more difficult to obtain and install. If a part has to be specially manufactured, special-ordered, or fabricated on-site, the company may not be able to complete the repair within one year. For example, one company has indicated that its supplier is quoting 44-46 weeks for the delivery of a 1000 ton water chiller, with a charge of approximately 10,000 pounds of refrigerant. The company estimates that it needs 5-7 weeks to negotiate an