emissions would be minimal. This claim ignores the substantial leakage emissions from nearly all refrigeration equipment, and especially retail food and industrial refrigeration systems.

One commenter expressed concern that EPA was forcing industry to use R-402A, another refrigerant deemed acceptable under SNAP. EPA disagrees, as it has already listed several other alternatives for R-502, including R-404A, R-407A, R-407B, R-408A, and R–507. The commenter also stated that using refrigerants other than R-403B would result in the production of an untenable amount of contaminated oil requiring special handling under RCRA. Exemptions exist for CFC-contaminated oil, and the volumes involved would be absorbed easily into the existing used oil infrastructure.

One commenter stated that EPA had departed from its usual listing of PFCs as acceptable subject to narrowed use limits, and requested that EPA include R–403B in the same category. However, EPA has only found PFCs acceptable where no other alternative is feasible from a technical or safety perspective. A large number of other acceptable substitutes exist for R–502 that contain substances with much lower GWPs and shorter lifetimes. Thus, this FRM promulgates the unacceptability determinations for R–403B and R–405A.

However, two commenters requested that EPA consider grandfathering existing uses of R–403B. In two specific cases, EPA determined that grandfathering is appropriate: Industrial process refrigeration and refrigerated transport. These cases are explained in detail in the section discussing R–403B.

d. Perfluorocarbons (PFCs). One commenter requests that EPA not impose a narrowed use limit on PFCs used in heat transfer applications. The commenter further suggests that this designation is inconsistent with previous narrowed use limits imposed in other sectors. The commenter also indicated that EPA has already received ample proof of several applications where PFCs are the only viable alternatives.

EPA believes the PFCs may be the only viable substitutes for specific types of existing heat transfer equipment. For example, as listed in the SNAP FRM, uranium enrichment plants are already an acceptable use for PFCs. This user has already demonstrated that no other substitute would work. EPA agrees with the commenter that for existing equipment, sufficient evidence exists that no substitutes other than PFCs exist. Thus, EPA is allowing the use of PFCs in retrofit and existing system designs only. For new equipment designs, however, EPA believes other alternatives may well exist. Therefore, for new equipment designs, users must conduct a study to determine that no other alternative is feasible. Note that users need only retain the analysis for their own records; no submission of information to EPA is required.

If EPA were to grant unconditional acceptability, there would be no requirement for users to examine other substitutes before adopting PFCs. EPA has articulated the view that, because of their high GWPs and very long lifetimes, PFCs must remain alternatives of last resort; in other words, their use should be limited to those areas where no other means exist to replace ODS. While the niche market for PFCs in heat transfer applications may be small, EPA has a strong interest in restricting its growth. As discussed above, PFCs have extremely long lifetimes and high GWPs. EPA strongly encourages manufacturers to devise other means of replacing the ODS used in heat transfer.

The commenter also objects to EPA's description of PFCs as agents of last resort. EPA maintains that for new heat transfer equipment, systems should use PFCs only where no other alternatives will work. For the reasons described in the paragraph above, this FRM retains the original language.

However, EPA agrees with the commenter's request to provide additional guidance about the types of systems that may require PFCs. EPA has included specific examples in the listing for PFCs.

The commenter also objected to EPA's reference to future rulemakings under section 608 of the Clean Air Act. EPA agrees and has removed the reference.

The commenter further believes EPA should grant acceptance to the use of PFCs in several specific end-uses, rather than issuing a narrowed use limit determination for heat transfer as a whole. The commenter cites as an example the listing of PFCs as acceptable for use in uranium enrichment plants. EPA believes that heat transfer systems bear enough similarity to be included under one enduse. The substitutes list should not be complicated by too many subcategories which would result in significant redundancy. The distinction between retrofit and new use will allow existing equipment to use non-ODS substitutes while still restricting the design of new systems that would use PFCs. For the reasons stated above, EPA believes it is important to place such a restriction on the design of new systems. However, even within new use, the narrowed use limit is intended to allow the use of an

otherwise unacceptable substitute in cases where nothing else is feasible from a safety or technical perspective.

The commenter also expresses a belief that EPA should not include heat transfer systems within the refrigeration and air conditioning sector. EPA disagrees and has already issued a final applicability determination that Vaportran transformers are appliances that fall under regulations issued under section 608 of the Clean Air Act. While heat transfer is not refrigeration in the thermodynamic sense of moving heat from a cool area to a warm one, it is a process aimed at temperature control.

The commenter further notes that EPA indicated that the refrigeration and air conditioning sector includes all mechanical and non-mechanical refrigeration, air conditioning, and heat transfer. The commenter believes this statement causes confusion by neglecting to define "non-mechanical refrigeration." EPA's intention was to include alternative processes that do not use a refrigerant in the strictest sense, such as evaporative cooling or absorption cycle machinery. The term "mechanical" is intended to refer to compressor-drive vapor compression cycle systems. However, EPA agrees that the statement in the NPRM was confusing and has removed the reference to non-mechanical refrigeration in this FRM

e. Hydrocarbon Blend B. One commenter requested that EPA find Hydrocarbon Blend B acceptable based on several reports. EPA had previously reviewed the bulk of these reports and found them insufficient to demonstrate the safety of this substitute. In addition, the statement that Hydrocarbon Blend B has a high ignition point is misleading. This blend readily ignites at room temperature in the presence of a spark or a flame. No report has supported the notion that this blend must be heated to very high temperatures before it will propagate a flame. As stated in the SNAP FRM on March 18, 1994, EPA requires a comprehensive, scientifically valid risk assessment if a refrigerant is flammable, and no such study has been performed. EPA therefore maintains its position that Hydrocarbon Blend B is unacceptable as a substitute for CFC-12 in automobiles and several other enduses.

3. Substitutes for Refrigerants

Substitutes fall into eight broad categories. Seven of these categories are chemical substitutes used in the same vapor compression cycle as the ozonedepleting substances being replaced. They include hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs),