not currently in production. (Joint Comments, No. 49 at 5)

The industry members of the Joint Comments constructed 100 ERA input files on products ranging from compact refrigerator-freezers and freezers to fullsize automatic defrost refrigeratorfreezers. The standard uncertainty of the ERA model using this input data was approximately 19 percent. The Joint Comments argued this accuracy level makes the ERA useful to examine engineering assessments of energy savings options, but not a sufficient tool to determine multi-million dollar rulemaking impacts. (Joint Comments, No. 49 at 5)

AHAM also had Dr. Clark Bullard at the Air Conditioning and Refrigeration Center of the University of Illinois conduct an evaluation of the ERA model. (AHAM, Transcript at 296). This analysis of the ERA model focused on the ability of the model to properly evaluate nonconventional technologies which have yet to be built into full-size refrigerator-freezers and tested or are not yet currently in production. Dr. Bullard's final report noted that many of these design options as modeled by the ERA had errors between 50-75 percent compared to laboratory measurements of these technologies. (Joint Comments, 49 at 6).

The Environmental Protection Agency submitted the User's Manual for the EPA Refrigerator Analysis Program. (EPA, No. 34, Appendix 2). The EPA also submitted a rebuttal statement, "Response to Report by Clark Bullard Associates Accuracy Analysis of the ADL/EPA Refrigerator Analysis (ERA) Model." (EPA, No. 34, Appendix 7). One of the EPA comments is that Dr. Bullard's analysis was based on an older version of ERA, which preceded the "official" release of Version 1.0. Version 1.0, which DOE used for its analysis, addressed the concerns about the model raised by Dr. Bullard. (EPA, No. 34, Appendix 7, cover letter).

The Department has reviewed the reports by Dr. Bullard and by the EPA concerning the ERA model. In performing the engineering analyses, the Department selected actual refrigerator models to use for each baseline case. The measured energy use for each of these baseline models (supplied by AHAM and its members) was used to calibrate the model for each class of refrigerator product evaluated. To account for changes in performance due to the use of HFC-134a, the Department used HFC-134a compressor maps in modeling each refrigerator class. For those design options included in the cost-efficiency analyses but not directly

modeled with ERA, such as gasket improvements and vacuum panel insulation, DOE energy-efficiency improvement estimates were based on measured data or other methods of calculating the energy savings. (See discussions of individual design options.) In summary, the Department has utilized measured data rather than theoretical predictions whenever data has been available.

*c. CFC Phaseout.* AHAM stated the costs of CFC elimination are not included in the analysis. The effect of CFC elimination must first be taken into account before proceeding with implementing options to meet various standard levels above the 1993 energy standard. (AHAM, No. 17, Attachment 17 at 3).

The Department has accounted for the costs of CFC phaseout by increasing the cost of the baseline units. The manufacturer's costs associated with the phaseout of CFC are accounted for in the manufacturer impact analysis. (See discussion under "baselines," below.)

4. Standards Proposed in the Joint Comments. The standards shown in Table 1, with accompanying discussions, were proposed in the Joint Comments. (Joint Comments, No. 49 at 14–27).

## TABLE 1.—STANDARDS PROPOSED IN THE JOINT COMMENTS

Product class	HCFC-containing product	HCFC-free product
<ul> <li>i. Automatic Defrost Refrigerator-Freezers (excludes compact refrigerator-freezers): <ol> <li>Top-mounted freezer without through-the-door ice service</li> <li>Top-mounted freezer with through-the-door ice service</li> <li>Side-mounted freezer without through-the-door ice service</li> <li>Side-mounted freezer with through-the-door ice service</li> <li>Side-mounted freezer with through-the-door ice service</li> <li>Soltom-mounted freezer without through-the-door ice service</li> <li>Compact Refrigerator-Freezers (AHAM/FTC volume less than 7.75 cubic feet and less than 36 in being but</li> </ol> </li> </ul>	9.80AV+276.0 10.20AV+356.0 4.91AV+507.5 10.10AV+406.0 4.60AV+459.0	10.78AV+303.6 11.22AV+391.6 5.40AV+558.3 11.11AV+446.6 5.06AV+504.9
<ol> <li>Inches in height):</li> <li>Manual defrost refrigerator-freezer</li></ol>	10.70AV+299.0 7.00AV+398.0 12.70AV+355.0 7.60AV+501.0 13.10AV+367.0 11.40AV+391.0 9.78AV+250.8 10.45AV+152.0	11.77AV+328.9 7.70AV+437.8 13.97AV+390.5 8.36AV+551.1 14.41AV+403.7 12.54AV+430.1 10.76AV+275.9 11.50AV+167.2
<ul> <li>iii. Freezers (excludes compact freezers): <ol> <li>Upright automatic defrost</li> <li>Upright manual defrost</li> <li>Chest freezer manual defrost</li> <li>Manual and partial defrost refrigerator-freezers (excludes compact refrigerator-freezers): <ol> <li>Manual defrost</li> <li>Partial automatic defrost</li> </ol> </li> </ol></li></ul>	12.43AV+326.1 7.55AV+258.3 9.88AV+143.7 8.82AV+248.4 8.82AV+248.4	13.67AV+358.7 8.31AV+284.1 10.87AV+158.1 9.70AV+273.2 9.70AV+273.2

AV=Total adjusted volume, expressed in ft3.

a. Full Sized Refrigerator-Freezers. The proposed standards "are based on a negotiated approach to identifying the maximum level of efficiency that is technologically feasible and economically justified. A negotiated approach may provide slightly different results from those achieved by conventional rulemaking because this NAECA criterion can be satisfied in a more flexible way, providing greater overall energy savings for a given level of impacts." (Joint Comments, No. 49 at 14). That flexibility permitted the participants, for the first time, to