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Corrigé

RAPPORT FINAL SUR L'EVALUATION DES PROJETS D'AEROSOLS

Ce corrigé est distribué afin de :

- **Ajouter** la phrase suivante à la fin du paragraphe 10 : « Une surestimation du niveau de référence de la consommation est difficile à quantifier sans vérifier les livres comptables de l'entreprise, mais probable dans quelques entreprises dont les taux d'utilisation des capacités de production converties sont très bas »
- **Ajouter** la ligne suivante dans la deuxième partie du paragraphe 15, ligne 11, avant «Dans de nombreux cas, elles préféreraient… » : « Toutefois, l'ONUDI a indiqué qu'elle tenait les entreprises informées en permanence ».
- **Supprimer** la deuxième phrase du paragraphe 15 : **«** Dans un cas au moins, il a fallu revoir la préparation d'un site, quand les paramètres de l'équipement du projet ont enfin été révélés ».
- **Remplacer** le paragraphe 17 (a), par : « De demander aux agences d'exécution d'évaluer dans chaque projet futur la faisabilité de la conversion du gazeur à base de CFC, du remplisseur pour liquide, et du crible moléculaire afin de justifier les cas où celle-ci serait impossible ».
- **Supprimer** dans le paragraphe 38, la ligne 3 : **«** Pour un projet achevé d'un point de vue financier, des fonds doivent encore être remboursés (JOR/ARS/07/INV/14). »

- **Remplacer** la deuxième phrase du paragraphe 69 par la suivante : « Dans un certain nombre de cas, les entreprises se sont plaintes de ne pas connaître le nom du fournisseur d'équipement choisi par l'ONUDI jusqu'à ce qu'elles reçoivent le connaissement. Toutefois, l'ONUDI a indiqué qu'elle informait généralement les entreprises en permanence ».
- **Remplacer** l'Annexe II du document par les deux pages ci-jointes.
- **Remplacer** « mid-Asian LPG » par « LPG from Central Asia » dans l'Annexe IV, paragraphe 4.
- **Remplacer «** US $0.89 » par « US $ 0.089 » dans l'Annexe V, paragraphe 7 (d).

Annex II: Conversion Process And Requirements

1. The conversion of CFC propelled aerosols to HAP types involves a major change in formulation, labelling, production, storage and (often) transportation. About the only thing these two classes of propellants have in common is that they are liquids, under low to medium pressure at ambient conditions. The differences are as follows:

CFCs	HAPs
High liquid density	Low liquid density (40% that of the CFCs)
Non-flammable	Extremely flammable
Can be varied in pressure	Generally available in only one pressure
Medium solvency	Poor solvency
Essentially odourless	Often with offensive odours
Further purification not required	Further purification generally required for Art. 5 countries
Minor leaks in production are tolerated	Leaking machines cannot be tolerated
No leak detection equipment needed	Leak detection equipment is required

2. Because of their poor solvency, HAPs can cause the sedimentation of certain fragrance ingredients from cologne formulas, film-formers from hair sprays, resins from paint aerosols and polymers from mousses --- unless formulations are very carefully balanced and engineered. The resulting products are much lighter in liquid density than the corresponding CFC formulations. Consumer complaints about lightweight dispensers (often thought to be only partly filled), have led to increased product volumes per can or changes to larger cans and to higher levels of active ingredients (perfumes, germicides, insecticide toxicants and silicone mould release agents), so marketers can claim the same potency per can, as with the previous CFC products. Some fillers reported that the reduced acceptance of HAP products has hurt sales. Consumer resistance to "light-weighting" is greatest in India, but this complaint is slowly ebbing, worldwide, as consumers get accustomed to CFC free products.

3. The most profound difference between CFCs and HAPs is the extreme flammability of the latter. For example, a mere 17 ml of liquid HAP is sufficient to explode an empty 204 liter steel drum, if vaporized and uniformly mixed with air in the drum. This feature must be dealt with in all aspects of production, storage and sale. The escape of HAP (liquid or vapours) must be absolutely minimized. When HAPs do escape, as they always do, to some extent, in the gassing operation, methods must be employed to keep the concentration of gas very dilute to stay below the lower flammability limit, which is typically 2% of the vapour in air. The most reliable and least costly way to do this is to do the gassing outside, under a suitable roof. Normal air movements in open spaces keep HAP gas concentrations sufficiently low. In over 20 years, at numerous sites around the world, there has never been a fire incident associated with open-air gassing. If climatic conditions (cold weather, sand-storms) make open-air gassing an unattractive option, one can enclose the gassing machine in a well ventilated box, or gassing room, ideally to be situated outside the main plant. Several fillers seen have located their gassers either inside the main plant or in a room adjacent to it --- separated by a wall through which conveyors pass, taking cans out to be gassed and then back inside. In three cases, gassing was done deep inside the main building, with no mechanical ventilation. This was quite distressing.

Inside gassing should be made under highly protected conditions, always involving good ventilation to the outside, gas sensing and alarm equipment, fire extinguishers and other safety measures which add complexity to the filling operation. In fact, several fillers have complained that they must now employ more qualified plant workers, at extra cost, to competently handle the new equipment. Inside and enclosed gassers also elevate the project cost to much higher levels. In Lebanon, the group purchase of five boxed gassers, gas detection systems and related equipment has cost the MLF more than US $200,000 above the cost of simple open-air gassers. It follows that the economic and safety advantages of open-air installations should be stressed, even more than now.

4. Piping and hoses for liquid HAP should be brought inside the main building only when absolutely necessary. In the USA, at least four large filling plants were destroyed when intolerable amounts of HAP leaked from pipes or hoses. Molecular sieve units, sometimes seen inside plants, should always be located outside, and in an open area. Periodically, these units must be opened, to remove saturated Zeolyte pellets and replace them with fresh absorbent material. Very large amounts of liquid and gaseous HAPs can be discharged in this process, depending upon sieve design and size. In a non-project incident, this was sufficient to blow out the back end of a filling plant near Johannesburg, South Africa. Hot water-bath leak testers for filled cans are needed, and incorporated in projects unless the beneficiary already has one. These tanks are designed to detect gross leakages of cans, as a result of faulty dispenser design or sealing. There are still possibilities for slow leakage and latent (delayed) leakage, and for these reasons warehouses for filled HAP aerosols should have at least modest ventilation, to carry off flammable vapours. This was rarely encountered in the projects visited.