The Higher Council of the Prevention of the Technological Risks
Meeting of January 25, 2011
Determination of French thresholds of acute toxicity in the event of accidental emission of chemical substances in the atmosphere for beryllium

Within the framework of the prevention of the risks related to accidental emissions in the atmosphere of dangerous chemical substances, the managers of risks wish to have the thresholds of acute toxicity which will be generally used associated scenarios of accidents for studies of dangers or the development of emergency plans. Also, in order to harmonize at the national level the values retained in the studies of the dangers and the plans emergency, a group of experts toxicologists proposes, on the basis of methodology, the thresholds of acute toxicity of certain dangerous substances by retaining in priority the substances concerned with the installation of PPRT. For each examined substance, the determination of the toxic thresholds of effects is the subject of a technical draft report which gathers the experimental and human data available of acute toxicity. These reports/ratios are submitted to a critical examination by the group of experts. The toxic thresholds of effects suggested by the group of experts are presented for information at the Higher Council of the Prevention of the Technological Risks (CSPRT). This presentation aims to inform the interested parts (industrialists, inspection, associations…) evolutions in progress in the event of substantial modifications. This presentation cannot lead, without a argued demonstration, with a questioning of the scientific value of the reports/ratios examined by the group of experts toxicologists. On the basis of report, after consultation of the group of experts toxicologists and information of the CSPRT, the ministry for ecology, energy, the durable development, transport and housing and the sea, in load of green technologies and the negotiations on the climate validates the thresholds which will be used as reference for the studies of dangers of the classified installations. The corresponding reports/ratios and thresholds are the subject then of a setting on line on Internet. Since 2001, the following substances were thus treated: ammonia, chlorine, acid hydrochloric, phosgene, formaldehyde, MDI, TDI, acid hydrofluoric, acid hydrocyanic, nitric oxide, nitrogen dioxide, sulphur dioxide, trioxide of sulphur/acid sulphuric, acrylonitrile, hydrogen sulphide, vinyl chloride, hydrazine, méthylamine, dioxide of chlorine, phenol, methanol, acrolein, methacrylate of allyl, acrylate of 2-diméthylaminoéthyle, alcohol allyl, ethyl acrylate, methyl acrylate, monochlorure of sulphur, acid methacrylic, arsine, phosphine, brominates, ethylene oxide, oxidizes propylene, trichlorotoluene, bromide of hydrogen, carbon tetrachloride, 2-methoxyéthanol, 1-2 dichloroethane, acid acrylic, methyl chloride, dimethyl disulphide (DMDS), thionyl chloride, phosphorus oxychloride, uranium hexafluoride, epichlorhydrine, acid nitric.

Beryllium: Pure beryllium is not found in nature. It is present in the form of ores, mainly as bertrandite, a silicate, and as beryl, an alumino-silicate. Beryllium is an at the same time a hard and light element. Its use in the form of pure metal is limited to very specialized sectors such as aerospace and nuclear power which benefit from its properties. Its principal use today is in the form of alloys, and mainly as nickel, aluminium and copper alloys. Even with low contents of beryllium, these alloys have improved mechanical, electric and thermal properties. Beryllium is also an additive of magnesium alloys, where a very small quantity (approximately 0,001%) makes it possible to reduce the flammability.

Metal beryllium was initially used as a structural material for rockets and satellites, for the manufacture of satellite mirrors, for neutron moderators and reflectors in nuclear reactors, for the manufacture of X-Ray tube windows, for radiation monitors and for the manufacture of optical support structures.

2 accidents which have occurred in the world are indexed in the Aria database of BARPI since 1990. Their consequences are not described.

The group of expert toxicologists, on the basis of information available in the literature, proposes the following values (Attention: The values are in mg.m-3 because exposure is in the form of aerosol particulates):

	Time (mins)							
	1	**10**	**20**	**30**	**60**	**120**	**240**	**480**
Limit of lethal effects : (SEL 5%) en mg.m^{-3}	The results in the literature are insufficient to determine limits.							
Limit of the first lethal effects (SEL 1%) en mg.m^{-3}	The results in the literature are insufficient to determine limits.							
Limit of irreversible effects(SEI) en mg.m^{-3}	51	23	19	16	8	4	2	1
Limit of reversible effects : (SER) en mg.m^{-3}	The results in the literature are insufficient to determine limits.							
Detection limit (SP) en ppm	No detection limit has been determined.							