



General Distribution

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ISOE INFORMATION SHEET

MAN-SIEVERT MONETARY VALUE SURVEY (2002 UPDATE)

ISOE European Technical Centre - Information Sheet No. 34 (2003)

In order to balance the costs associated with radiological protection options and their benefits in terms of exposure reduction the International Commission on Radiation Protection has suggested the use of cost benefit or cost effectiveness analysis in which options' benefits or effectiveness are given a monetary value according to a monetary reference value of the avoided unit of exposure: the man-sievert value, often referred as "alpha value".

In 1997, the ISOE European Technical Centre performed a first international survey among regulatory bodies and nuclear facilities to check the actual use of such a tool in the different countries.

The main conclusions, as well as the values used have been made available through the ETC ISOE Information Sheet No. 18 downloadable from the ETC Web site (<http://isoe.cepn.asso.fr/>).

Five years later, it appeared useful to check whether the values have evolved or not. Therefore a second survey has been performed in 2002 among all the ISOE participants. The following tables show a synopsis of the 1997 and 2002 results. The graphs present only the 2002 values. It is noticeable that the "alpha values" have not been drastically modified but in Romania where the values were very low as compared with other countries.

Annex 1: Adoption by regulatory bodies in charge of radiological protection of a system of man-sievert reference monetary values

Countries	1997 Survey		2002 Survey	
	Existence of man-sievert monetary value system	α -values per man-mSv (in Euro)	Since	α -values per man-mSv (in Euro)
Armenia			under consideration	
Belgium	No value	-	<i>no new answer</i>	
Canada	1997 ALARA guidelines referring to the concept to be published	65.65 EUR (100 CAD) as an international reference	<i>no new answer</i>	
China	under consideration		<i>no new answer</i>	
The Czech Republic	Decree No. 184/1997 of 24/07/1997	15.71-78.56 EUR (500-2500 CZK) depending on indiv. dose level and exposure situation	RP Decree No. 307/2002 of 13/06/2002	15.71-78.56 EUR (500-2500 CZK) depending on indiv. dose level and exposure situation
Finland	1984 recommended value 1991 recommended value	18.65 EUR (20 USD) 93.26 EUR (100 USD)	<i>no new answer</i>	
France	No value		No value	
Germany	No value		No value	
Italy	No value		No value	
Japan	No value		No value	
Korea	under consideration		<i>no new answer</i>	
Netherlands	1995 recommended value	453.78 EUR (1000 NLG)	<i>no new answer</i>	
Romania	under consideration		Approval of the α -value proposed by Cernavoda NPP 205.17 EUR (220 USD)	
Slovakia	under consideration		RP Decree No. 12/2001 in 2001 adjusted by consumer price	<2 mSv: 48.27 EUR (2000 SKK) 2-5 mSv: 120.68 EUR (5000 SKK) 5-15 mSv: 362.03 EUR (15000 SKK) 15-30 mSv: 482.71 EUR (20000 SKK) 30-50 mSv: 603.38 EUR (25000 SKK)
Spain	under consideration		No value	
Sweden	Nordic countries common value: 1984 recommended value 1991 recommended value SSI: 1992 recommended values	18.65 EUR (20 USD) 93.26 EUR (100 USD) 43.23-216.15 EUR (400-2000 SEK)	recommended values adjusted by consumer price	50.8-259.38 EUR (470-2400 SEK)
Switzerland	1994 recommended value	2027.99 EUR (3000 CHF)	<i>no new answer</i>	

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 no answer

Table 2: Corporate or NPP alpha values for occupational exposure: single values

Countries	Nuclear Power Plant	1997 Survey		2002 Survey	
		Date of system set-up	α -value per man-mSv (in Euro)	Since	α -value per man-mSv (in Euro)
Bulgaria	Kozloduy NPP			No value	
Belgium	ELECTRABEL			No value	
Canada	Gentilly NPP	seventies	636.5 EUR (1000 CAD)	636.5 EUR (1000 CAD)	
Finland	Olkiluoto NPP			1998	170 EUR
Hungary	Paks NPP			1999	636.5 EUR (25000 HUF) will be updated in 2003
Romania	Cernavoda NPP	1996 the values of the system depends on individual dose level	<10 mSv: 2.8 EUR (3 USD) >10 mSv: 4.66 EUR (5 USD)	1998	205.17 EUR (220 USD)
Slovenia	Krsko NPP	1996	652.8 EUR (700 USD)	2003	1000 EUR
South Africa	Koeberg NPP	1993	932.57 EUR (1000 USD)	1 March 2003	1212.35 EUR (1300 USD)
Spain	Vandellos 2 Jose Cabrera			No value	
	Asco NPP	1982 1994	601.01 EUR (100000 ESP) 1865.15 EUR (2000 USD)	2002	1865.15 EUR (2000 USD)
Sweden	same value for all NPPs	1992	432.31 EUR (4000 SEK)		
	Barsebäck NPP Ringhals NPP Oskarshamn NPP			2002	486.34 EUR (4500 SEK)
	Forsmark NPP			In process of updating 432.31 EUR (4000 SEK)	
United States	90% of NPPs	1990/1991 but for highest values 1993/1997	from 466.29 to 2620.54 EUR (500 to 2810 USD) median: 932.57 EUR (1000 USD) average: 1119.09 EUR (1200 USD)		
United States	93% of NPPs			2002	466.29 to 3730.3 EUR (500 to 4000 USD) median: 1165.72 EUR (1250 USD) average: 1305.6 EUR (1400 USD)

Exchange rate of the 27 March 2003


 no answer

Table 3: Corporate or plant alpha values for occupational exposure: set of values

Country	Corporate or NPP	1997 Survey		2002 Survey	
		Date of system set-up	α -values per man-mSv (in Euro)	Since	α -values per man-mSv (in Euro)
Belgium	CEN SCK Mol <i>the values of the system depends on annual individual dose level</i>	1995	<1 mSv: 24.79 EUR (1000 BEF) 1 - 2 mSv: 61.97 EUR (2500 BEF) 2 - 5 mSv: 247.89 EUR (10000 BEF) 5 - 10 mSv: 619.73 EUR (25000 BEF) 10 - 20 mSv: 1239.47 EUR (50000 BEF) 20 - 50 mSv: 4957.87 EUR (200000 BEF)	1995	<1 mSv: 24.79 EUR (1000 BEF) 1 - 2 mSv: 61.97 EUR (2500 BEF) 2 - 5 mSv: 247.89 EUR (10000 BEF) 5 - 10 mSv: 619.73 EUR (25000 BEF) 10 - 20 mSv: 1239.47 EUR (50000 BEF) 20 - 50 mSv: 4957.87 EUR (200000 BEF)
Canada	Darlington NPP <i>the values of the system depends on the type of worker category</i>	(?)	from 63.65 to 1272.99 EUR <i>(from 100 to 2000 CAD) *</i>		<i>no new answer</i>
France	EDF <i>the values of the system depends on annual individual dose level</i>	1993	0 - 1 mSv: 15.24 EUR (100 FRF) 1 - 5 mSv: 60.98 EUR (400 FRF) 5 - 15 mSv: 350.63 EUR (2300 FRF) 15 - 30 mSv: 1021.41 EUR (6700 FRF) 30 - 50 mSv: 2286.74 EUR (15000 FRF)	2003	0 - 10 mSv: 650 EUR 10 - 16 mSv: 1300 EUR 16 - 20 mSv: 1800 EUR
Germany	VGB proposal agreed on by all utilities for testing <i>the values of the system depends on annual individual dose level</i>	1996/ 1997	<1 mSv: no value 1 - 10 mSv: 150 EUR (300 DEM) 10 - 20 mSv: increasing value up to 1500 EUR (3000 DEM)		In process of updating
Netherlands	Borssele NPP <i>the values of the system depends on individual dose level</i>	1992	<15 mSv: 453.78 EUR (1000 NLG) >15 mSv: 907.56 EUR (2000 NLG)	2002	<10 mSv: 500 EUR >10 mSv: 1000 EUR In process of updating
Spain	Cofrentes NPP <i>the values of the system depends on the unit annual collective dose level and on individual dose level</i>	1994	<3 man-Sv per unit per year on a 3 years average: 601.01 EUR (100000 ESP) >3 man-Sv per unit per year on a 3 years average: 901.52 EUR (150000 ESP)		Total collective dose: <1250 man-mSv on a 3 years average = 1000 EUR >1250 man-mSv on a 3 years average = 5000 EUR Individual dose: <10 mSv = 1000 EUR >10 mSv = 5000 EUR


Exchange rate of the 27 March 2003

* ex: general workers: 127.3 EUR (200 CAD); reactor maintenance crew: 954.75 EUR (1500 CAD)

Table 3: Corporate or plant alpha values for occupational exposure: set of values (next)

Country	Corporate or NPP	Date of system set-up	α -values per man-mSv (in Euro)	Since	α -values per man-mSv (in Euro)
Switzerland	Beznau NPP <i>the values of the system depends on individual dose level per job</i>			1995	338 EUR (500 CHF) and 3379.98 EUR (5000 CHF) if individual dose > 10 mSv
	Sizewell NPP <i>the values of the system depends on annual individual dose level</i>	?	use of the NRPB data set from 14.68 to 29.36 EUR (10 to 20 GBP)		<i>no new answer</i>
USA	BNFL <i>the values of the system depends on annual individual dose level</i>				For individual doses < 5 mSv: NRPB data set from 14.68 to 29.36 EUR (10 to 20 GBP) if individual dose > 5 mSv: multiplied by a factor of 3 if individual dose around 10 mSv: multiplied by a factor of 5
	South Texas NPP <i>the values of the system depends on annual individual dose level</i>	1993	<10 mSv: 466.29 EUR (500 USD) >10 mSv: 2331.44 EUR (2500 USD)	2002	<10 mSv: 466.29 EUR (500 USD) >10 mSv: 2331.44 EUR (2500 USD)
	Haddam Neck NPP Millstone 2 NPP			2002	From 93.26 to 1865.15 EUR (from 100 to 2000 USD)
	Oyster Creek NPP			2002	From 932.57 to 1865.15 EUR (from 1000 to 2000 USD)
	Prairie Island NPP			2002	From 1398.86 to 1865.15 EUR (from 1500 to 2000 USD)

Exchange rate of the 27 March 2003

 no answer

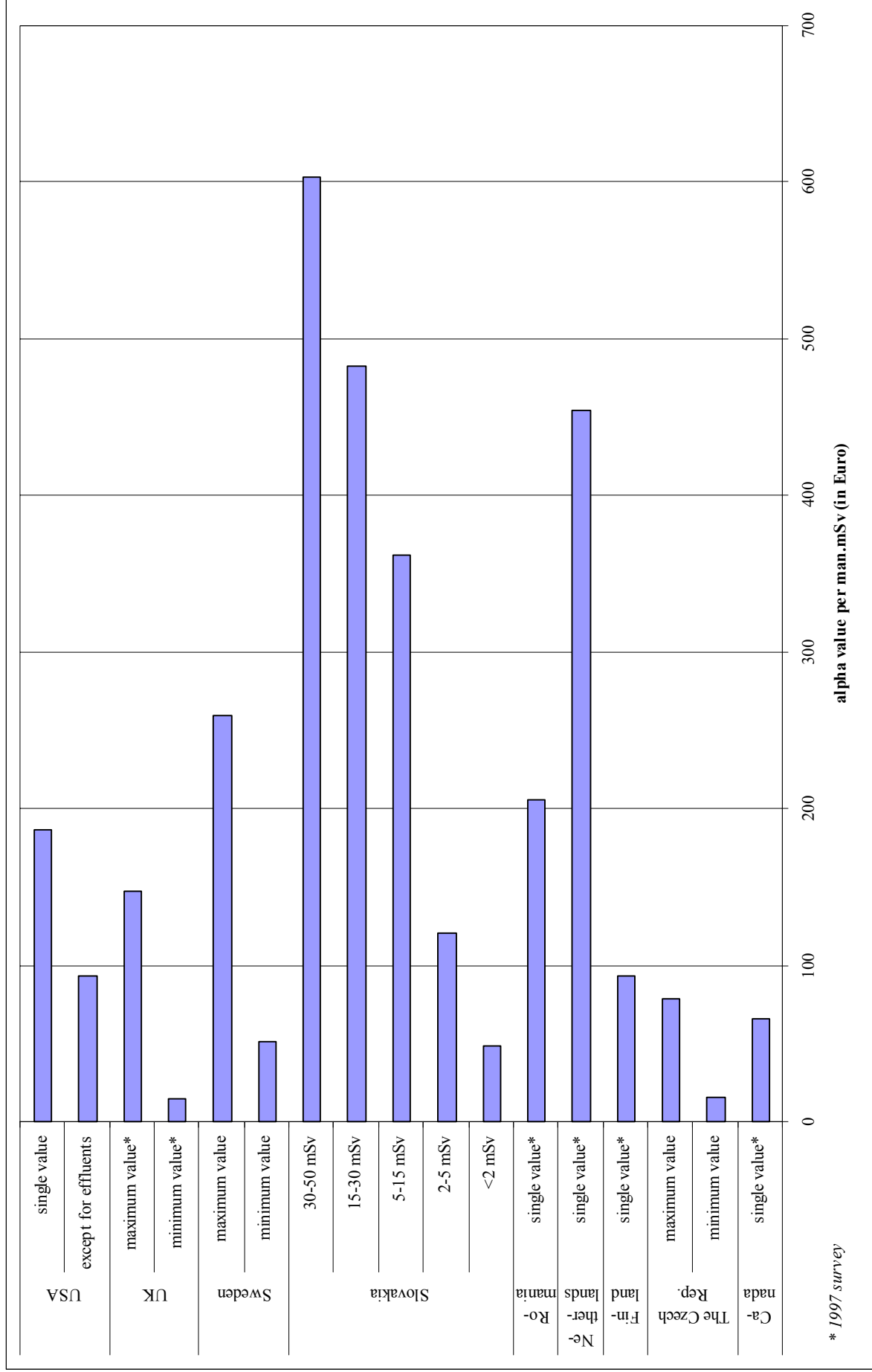


Figure 1. Alpha values adopted by the Regulatory bodies

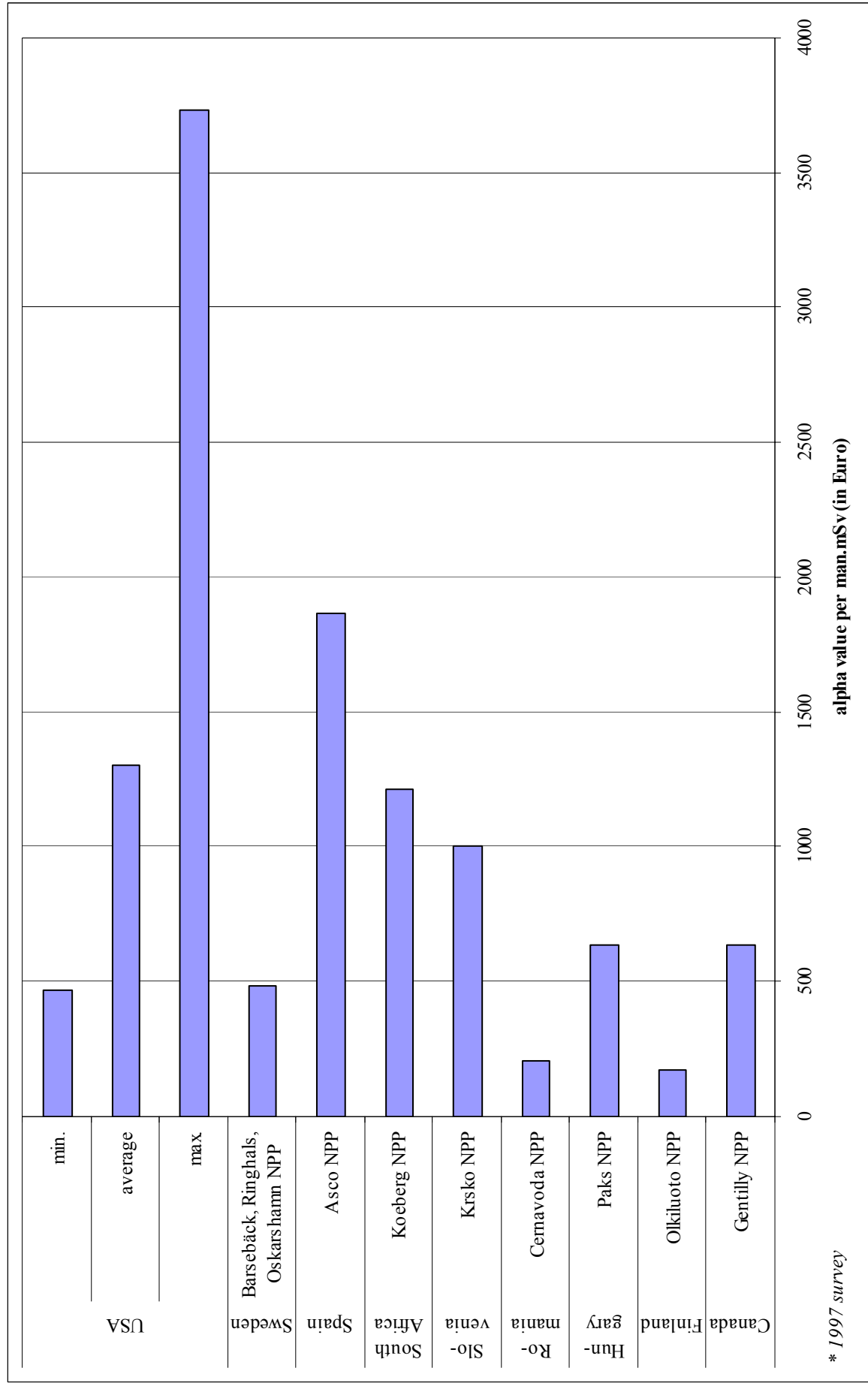
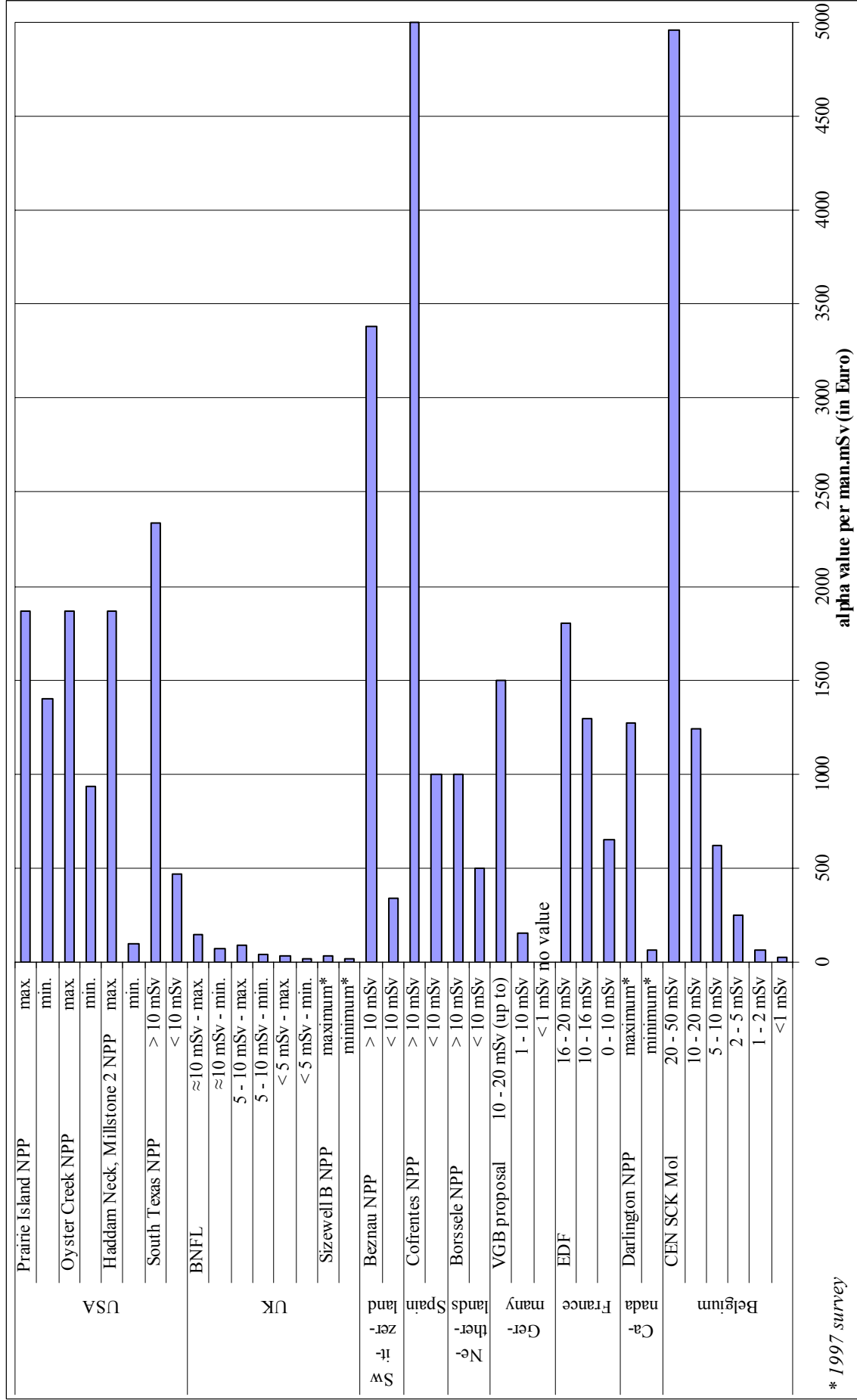


Figure 2. Corporate or NPP alpha values for occupational exposure: single value



* 1997 survey

Figure 3. Corporate or NPP alpha values for occupational exposure: set of values