Appendix

Summary of individual cases investigated in 2012 to 2023

A Possible non-uniform exposure in which the relationship between dose to a personal dosemeter and to the body is uncertain

A539		
Cells scored	501	The badge of an individual working with gamma radiography showed a reading of 82 mSv in both August and again in November. The worker admitted that there might have been some irregularities including the possibility of leaving their badge in the test bunker. The company had investigated for the two specific months, but could not find any fault in the use of the badges. The probability the dose was less than 100 mGy was ~ 75%.
Dicentrics	0	
Centric rings	0	
Other aberrations	3	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	82	
A540		
Cells scored	1000	Refer to main text
Dicentrics	3	
Centric rings	0	
Other aberrations	11	
Biological dose (Gy)	0.05	
95% CL (Gy)	0-0.13	
Badge dose (mSv)	0.21 (body) 0.19 (skin)	
A541		
Cells scored	500	Chromosome analysis was requested to confim or eliminate an exposure to X-rays when a worker was found to have a 432 mSv reading on a film badge. Based on comparison with our standard X-ray dose-response calibration curve, the most likely whole-body dose was estimated at < 100 mGy. Nevertheless, the results suggest that it is much more likely that the actual dose received by the individual was 0 Gy than 432 mGy (with an odds ratio of approximately 4000:1). The calculated overall probability of a dose less than 100 mGy was 95%.
Dicentrics	0	
Centric rings	0	
Other aberrations	3	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	432	

A542		
Cells scored	500	Refer to main text
Dicentrics	1	
Centric rings	0	
Other aberrations	2	
Biological dose (Gy)	0.075	
95% CL (Gy)	0-0.25	
Badge dose (mSv)	Not provided	
A543		
Cells scored	500	An employee in a private company testing welds in chimneys and heating pipes with an X-ray device, but who also worked with a gamma source, had no explanation for the badge dose of 366 mSv. Based on our standard Co60 gamma calibration curve, the most conservative option in this case, we estimate that any dose received would have been < 100 mGy. The probability that this individual received a dose of less than 366 mSv is > 99%. In conclusion, the most likely dose was less than 100 mGy, the minimum detectable dose for the dicentric assay in these exposure circumstances.
Dicentrics	1	
Centric rings	0	
Other aberrations	0	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	366	
A544		
Cells scored	500	A worker carrying out non-destructive materials testing showed very high reading on their dosemeter. No ill effects were reported, but a chromosome analysis was requested to eliminate the possiblity of an overexposure. The most likely estimate of whole body dose was ~100 mGy; the minimum detectable dose for the assay in these exposure circumstances. The dose estimation in these circumstances is very uncertain. Nevertheless, the test suggests that it is much more likely that the actual dose received was 0 Gy than 2560 mSv, with a probability of > 99%.
Dicentrics	1	
Centric rings	0	
Other aberrations	1	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	2560.28 (body) 2985.17 (skin)	

A545			
Cells scored	1000		An industrial radiographer returned a quarterly badge with a high reading. An investigation by the company revealed no reason for the high dose on the badge. All the work carried out by the individual was with X-rays in engineered safe bays. The biological estimate of dose did not confirm the badge dose and it was concluded that it was probable the badge had been left in a work box in the safe bay. The overall probability of a dose less then 0.1 Gy was approximately 95% and the probability of dose on the order of 1.5 Gy was < 0.001%.
Dicentrics	1		
Centric rings	0		
Other aberrations	1		
Biological dose (Gy)	<0.01		
95% CL (Gy)			
	Badge 1	Badge 2	
Badge dose (mSv)	1800 (body) 3000+ (skin)	34.3	
A546			
Cells scored	1000		Very high dose was recorded on the TLD badge over a three month period. The individual showed no radiation associated symptoms and an investigation suggested a genuine overexposure was very unlikely. No over exposure was confirmed by chromosome analysis. The overall probability of a dose less than 100 mGy was 99.9%.
Dicentrics	0		
Centric rings	0		
Other aberrations	5		
Biological dose (Gy)	<0.1		
95% CL (Gy)			
Badge dose (mSv)	3519.28 (body) 3886.47 (skin)		
A547			
Cells scored	500		A radiographer may have had their badge accidentally exposed to X-rays, but there was no other information provided. 1 rogue cell with multiple dicentrics and excess acentrics was identified but as such cells are believed to be the result of a viral infection they are not included in the dose estimation. The most likly whole body dose was <100 mGy and the test suggested that it was more likely the actual dose recieved was 0 Gy than >100 mGy.
Dicentrics	0		
Centric rings	0		
Other aberrations	2		
Biological dose (Gy)	<0.1		
95% CL (Gy)			
Badge dose (mSv)	Not provided		

A548		
Cells scored	1000	Chromosome analysis was requested for a radiographer with a badge that indicated an exposure to ionizing radiation. If it is though the badge not the person was exposed to the x-ray source and that chromosome analysis would provide reassurance in this case.
Dicentrics	1	
Centric rings	0	
Other aberrations	1	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	Not provided	
A549		
Cells scored	500	A radiation worker employed in the installation and application training for a company selling DXA-scanners and X-ray equipment, had a personal dosemeter with a reading of 212.8 mSV over a 3-month period. There was no explanation for the high dose from this worker and the TLC-film showed an uneven distribution of activity, but nothing else. The most likely whole body biological dose estimate for this worker was below 100 mGy, the minimum detectable dose in these exposure circumstances. It was more likely that the dose wase 0 Gy than the badge dose, with an odds ratio of approximately 300:1.
Dicentrics	0	
Centric rings	0	
Other aberrations	1	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	212.8	
A550		
Cells scored	1000	The personal dosemeter of a radiation worker showed a reading of 20.27 mSV. They had worked with 60 and 150 KeV X-ray sources (welding equipment). Investigation revealed no reason for such a badge dose. It was estimated that the most likely whole body dose was below 100 mGy, the minimum detectable dose for the assay in these exposure circumstances. It is more likely that the acutal dose received was 0 Gy than ~20 mGy with an odds ratio of about 1.6:1.
Dicentrics	0	
Centric rings	0	
Other aberrations	3	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	20.27	

A551		
Cells scored	1000	The TLC-dosemeter of a radiation worker recorded a reading of 89.1 mSv following work with X-rays (160 keV, 4 mA). This individual reported that they had left the dosemeter in the test bunker, but the TLC shows homogeneous radiation. The chromosome analysis estimated a dose below 100 mGy, with a dose of 0 Gy more likely than the badge dose with an odds ratio of about 60:1.
Dicentrics	0	
Centric rings	0	
Other aberrations	2	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	89.1	
A552		
Cells scored	1000	An individuals personal dosimeter recorded a dose of 135 mSv. The exposure conditions were a little unclear, but it was most probably a narrow beam X-ray exposure. Biological dosimetry was requested for reassurance purposes. The test suggested that it was more likely the actual dose received was 0 Gy than 135 mSv with an odds ratio of approximately 987:1.
Dicentrics	0	
Centric rings	0	
Other aberrations	2	
Biological dose (Gy)	<0.1	
95% CL (Gy)		
Badge dose (mSv)	135 (body) 42 (skin)	
A553		
Cells scored	1000	Refer to main text
Dicentrics	1	
Centric rings	0	
Other aberrations	6	
Biological dose (Gy)	0.03	
95% CL (Gy)	0-0.15	
Badge dose (mSv)	Not provided	

B Suspected overexposure of people not wearing a dosemeter

B156			
Cells scored	503		An radiographer was testing X-ray equipment and was not aware that it was running. The individual stood in front of the X-ray device for a maximum of 2 minutes at a distance of 0.5 to 1 metre. The exposure was considered to be whole body. As the individual was not wearing a personal dosimeter at the time of the incident, the dose was calculated to be approximately 20 to 100 mSv. In the exposure circumstances biological dosimetry suggested that the probability of a dose below 20 mSv was about 50% and a dose between 20 and 100 mSv was also about 50%.
Dicentrics	0		
Centric rings	0		
Other aberrations	3		
Biological dose (Gy)	<0.1		
95% CL (Gy)			
Badge dose (mSv)	na		
B157	Person (i)	Person (ii)	
Cells scored	2996	3003	
Translocations	14	9	Refer to main text.
Biological dose (Gy)	<0.1	<0.1	
95% CL (Gy)			
Badge dose (mSv)	na	na	
B158			
Cells scored	1000		
Dicentrics	23		
Centric rings	3		Refer to main text.
Other aberrations	27		
Biological dose (Gy)	0.333		
95% CL (Gy)	0.22-0.45		
Badge dose (mSv)	na		