

INDEX

- AAGM, 196 – 199
- AATM, 286 - 288
- absorbed dose, 73
- Access Control System, 194 – 196, 197
- activated charcoal, 311
- activity, 43 – 44
- activation products, 49 – 52, 53, 55, 60 – 62, 209, 211
- acute exposure, 94, 96 – 103, 119
- Airborne Area, 205
- ALARA, 94, 111, 116, all of Chapter 12
- alert alarm, 414
- ALI, 230 – 234
- alpha radiation, 18, 19
 - contamination meter, 138, 157
 - decay schemes, 32, 33, 35
 - energy, 28
 - hand & shoe monitor, 138
 - ionisation, 22, 23
 - range, 27, 28
 - shielding, 28, 188
- amplifier, 154
- annihilation radiation, 25
- ankylosing spondylitis, 92
- atom, 1 – 3
- atom bomb survivors, 92
- atomic mass, 6 – 7
 - atomic mass unit, amu, 6
- atomic number, Z , 3, 4, 5
- atomic size, 7
- atomic structure, 1 – 3

- Beams, 186, 191
- becquerel, Bq, 43, 44
- beta radiation, 19, 28 – 30
 - contamination detectors, 136 – 138, 140 – 141
 - decay schemes, 33, 34
 - energy, 28 – 30
 - ionisation, 22, 23
 - range, 27, 28 – 30
 - shielding, 30, 188 – 189
 - sources, 188
 - survey meter, 143 – 144
 - surveys, 204
- bioassay, 256 – 259
 - urine samples, 241 – 242, 257
 - faecal samples, 257
 - whole-body counter, 169 – 160, 258
- Bioassay Update Report, BUR, 245 – 246, 339.– 341
- biological effects, 74, 87 – 103
- biological half-life, T_b , 229
- blood-forming system, 100
- breathing rate, 235
- Bremsstrahlung, 29, 142 – 143
- bubbler, see tritium bubbler

- CNSC, 109
- calibration sticker, 151
- cancer, 91 – 94
- canister site, 355
- capture gammas, see radiative capture
- carbon dating, 76
- carbon-14, 76, 79, 255 – 256
 - detection, 136, 256, 373
- cataracts, 101, 110
- cell division, 88
- central nervous system, 101
- change rooms, 298, 299
- chlorine hazards, 316, 417
- chronic exposure, 94
- circular reasoning, see reasoning, circular
- cobalt-60, 35, 61 – 62, 158, 209, 211
- committed dose, 235 – 236, 244 – 246, 249 – 250, 339
- compound, 10
- Compton scattering, 24, 25
- contamination, 54, 269 – 324
 - airborne, 278 - 290
 - noble gases, 284
 - particulates, 278 – 284
 - radioiodine, 284 – 285
 - tritium, 285 – 290
 - surface, 269 – 278
 - β/γ contamination meter, 140, 256, 272 – 277
 - control limits, CCL, 271 – 272, 324
 - direct measurement, 270 – 275
 - indirect measurement, 275 – 277
 - dosimetry, 278
 - fixed, 271 - 275
 - loose, 270, 271 – 272
 - sources, 269 – 270
 - surveys, 277 – 278
- continuous air monitor, CAM, 279 – 281
- cosmic rays, 75 – 76

critical group, 358, 361 - 362
 DAC, 235
 DCP, 342
 dead time, 150 – 151,
 decay of fields, 180 – 181
 decontamination, 318 – 324
 – chemical methods, 318 – 319
 – Decontam. Centre, 300, 321 – 322
 – of boilers, 179 – 180
 – of clothing, 323 – 324
 – of D₂O spills, 323
 – of equipment, 321 – 322
 – of skin, 298, 324
 – of work areas, 322
 – physical methods, 319 - 320
 – principles, 318, 320
 deep dose, H_D, 112, 163, 338
 DEL, 358 362
 deterministic effects, 110, 114
 DIF, 333, 334, 393
 dose check point, DCP, 342
 dose limits,
 – NEW, 112 – 117
 – public, 117 – 118
 dose records, 333 – 346
 – Monitoring Period Dose Report, 333 – 338
 – Occupational Dose Report, 343 – 344
 – station dose, 346
 dosimetry, 73, 162 – 170, 389 – 390

 Effective half-life, T_e, 229
 efficiency, 149 – 150
 elastic scatter, 48
 electromagnetic spectrum, 20
 electron volt, eV, 21
 elements, 4, 5
 emergency alarm, 415
 emergency plans, 411 - 421
 energy dependence, 143
 environmental monitoring, 78, 375 - 378
 equilibrium concentration, 237
 equivalent dose, 74 – 75
 excited state, 35
 eye lens, 101, 114, 117
 exclusion zone, 118, 352, 359
 external exposure, 177 – 220
 extremity dose, 114, 278, 335, 338

 Fallout, 80,
 fertility, 100
 fission, 46
 fission products, 55, 56 – 60, 209, 214
 fission yield, 57
 foetus, 101 – 103
 frisker, 182, 187, 273 – 274
 fuel failure, 58, 209, 214, 215, 249, 254
 fuel handling system, 212 – 214
 fuelling machine hazards, 214, 349, 401
 full-body monitor, 136 – 137
 fume hoods, 302

 Gamma radiation, 20
 – beams, 186, 191, 193
 – build-up, 191
 – decay schemes, 35
 – fields, 215 – 216
 – HVL, 30, 31, 189 – 191
 – shielding, see shielding, gamma
 – spectrum, 158, 160
 – survey, 202 – 203
 – survey meters, 133, 141, 147 – 148,
 157, 202,
 gas amplification, 177
 gaseous effluent monitoring, 368 – 373
 Geiger counters, 138 – 142, 272 – 274
 GI tract, 96, 100
 gonads, 88
 gray, Gy, 73
 ground state, 35

 H_T, H_W, H_{WB}, see tissue dose,
 weighted dose, whole-body dose
 half-life, 38 – 42, 180 – 181, 229
 half-value layer, HVL, see gamma
 hand & shoe monitor, 136, 291
 Hazard Info, 202, 393
 heavy water hazards, 308, 346 – 347,
 heavy water properties, 11
 heavy water recovery, 301
 hereditary effects, 89 – 90
 HEPA filters, 367
 Hot Spot stickers, 202 – 203
 hydrogen isotopes, 10

 ICRP, 93 – 94, 109 – 114, 375
 inelastic scatter, 48, 194
 instrument checks, 151 – 152
 instrument check source, 151
 infinity dose, 244 – 245
 intake, 230
 internal radiation, all Chapter 8, 335 – 336
 interzonal monitors, 271, 291

inverse square law, 162 - 186
 ionisation, 21 - 26,
 - in tissue, 71 - 72
 ion chambers, 132 - 135, 143,
 isotopes, 8 - 11

 Job Safety Analysis, 384 - 388

 KI pills, 250 - 251

 Lethal dose, 97 - 98
 line sources, 186 - 187
 liquid contamination, 270
 liquid effluent monitoring, 363
 - LEM, 364 - 365
 - LEPM, 365
 liquid scintillation counting, 160 - 161, 257, 290
 liquid zone control hazards, 211
 lost life expectancy, LLE, 120 - 122

 Masslinn Mop, 277
 mass number, A, 6
 medical exposure, 79 - 80
 moderator system, 209 - 211
 moderator system hazards, 61, 211, 247,
 399 - 401
 molecule, 10
 molecular sieve, 301
 mutation, 88 - 90

 Natural background radiation, 75 - 79, 82, 374
 neutrino, 35
 neutrons, 45 - 53
 - activation analysis, 53
 - dose records, 335
 - fast, 45, 52
 - fields, 217 - 218
 - ionisation, 26, 45
 - photoneutrons, 47, 56
 - range, 32
 - reactions
 - fission, 46
 - in tissue, 52, 53
 - (n, α), 50
 - (n, γ), 50 - 52
 - (n,p), 49
 - shielding, 192
 - slow, 45, 53
 - sources, 46, 47, 186, 193, 204, 217
 - surveys, 204
 - survey meter, 139, 145, 204
 - thermal, 45, 53
 NEW, 81
 non-stochastic, see deterministic
 non-transportable, 253, 258, 277
 nuclear forces, 17
 nuclide, 12, 17

 Occupational exposure, 80 - 81
 OEC, 419 - 420

 PAD system, 167 - 170
 - PAD, 167 - 168
 - procedures, 169 - 169
 - reader, 169
 - results compared to TLD, 169 - 170
 pair production, 24, 25
 pancake tubes, 140, 272 - 273
 particulates, 251 - 256, 278 - 283
 - DAC, 253-254, 278
 - long-lived, 252,
 - measurements, 278 - 283
 - short-lived, 252, 373
 - sources, 254 - 255
 - stack monitoring, 370 - 371
 PESL (Prot. Equip. Storage Location), 308
 phosphor, 153
 photoelectric effect, 24, 25
 photoneutrons, 47, 56
 phototube, 153 - 154
 PHT system, 206 - 208
 PHT system hazards, 208 - 209
 plane sources, 186 - 187
 plastics, see protective clothing
 point sources, 182 - 185
 portable AGM, 198, 200
 portal monitor, 161
 positron, 25, 34
 potassium-40, 78, 79
 pregnancy, 101 - 103, 117
 procedures, 200 - 201
 proportional counters, 138 - 139
 Protection Assistant, 388 - 389
 protection factor, PF, 310, 315
 - plastics, 306, 308
 - respirators, 315
 protective clothing, 303 - 310, 390
 - browns, 303 - 304
 - dispos, 304 - 305
 - footwear, 306
 - gloves, 305
 - lab coats, 304

- plastics, 306 – 309
- pulse height analysis, 158 – 160
- Quadricells, 87(#16), 353, 354 – 355
- Quality Factor, Q, 74
- Radiation Area, 205
- radiation risk, 90 – 103, 118 – 119
- radiation sickness, 95 – 98
- Radiation Work, 343
- Radiation Work Approval, 343
- radiative capture, 50 – 52, 55
- radiography, 80 – 81, 200
- radioiodine, 247 – 251
 - ALI, 233
 - behaviour in the body, 249
 - committed dose, 249 – 250
 - measurement, 250
 - sources, 248 – 249
 - thyroid blocking, 250 – 251
 - thyroid monitor, 159, 250
- radionuclide, 12
- radium dial painters, 92
- radon daughters, 77
- ratemeter, 145 – 147
- reasoning, circular, see circular reasoning
- Reference Man, 231
- Release Permit, 294 – 296
- respirators, 310 – 315
 - air-purifying, 311- 312
 - air-supplied, 313 - 314
 - fit-testing,
 - full-face, 311
 - half-face, 312
 - maintenance, 315
 - PF, 315
 - requirements, 315
 - SCBA, 314
 - tritium, 312
- respiratory hazards, 314 – 315
- Response Team, 413 – 414
- response time, 148 – 149
- Restricted Radiation Area, 205
- risk, 118 – 122
- Rubber Area, 296 – 297
- Rubber Change Area, 297
- Safety checklist, 397
- Safety Precedence Sequence, 177 – 179, 385 – 388
- Safety Wheel, 385
- Safety Work Plan, 393 – 397
- scaler, 145 – 146
- scintillation counters, 152 – 157
- shallow dose, 112, 338
- shielding, 188 – 194
 - alpha, 27, 188
 - beta, 28, 30, 188 – 189
 - biological, 193
 - gamma, 30 – 31, 189 – 192
 - neutron, 31, 192
 - penetrations, 184, 192
 - shutdown, 193
 - temporary, 257, 191
 - thermal, 259
- signposting, 204 – 206, 389
- skin, 72, 99, 114
- smears, 275 – 277
- somatic effects, 87, 90, 94 – 102
- spot sampler, 281- 283
- stack monitoring, 368 – 373
- sterility, 100
- stochastic, 110
- SRWMF, 294, 351 – 356, 377
- surveys, 201 – 204, 389
- Target tissue, 229
- ten-day rule, 102
- thyroid, 100, 249
 - blocking, 250 – 251
 - monitor, 159, 250
- tissue dose, H_T , 112 – 113, 231
- TLD system, 161 – 167
 - accuracy, 166
 - badge, 163
 - environmental, 376
 - extremity, 390
 - neutron response, 164 – 165
 - PAD discrepancies, 169 - 170
 - procedures, 166 – 167
 - reader, 164
- transportable, 228, 253, 257
- tritium, 236 – 247, 285 – 290
 - ALI, 233, 235, 240
 - behaviour in the body, 238 – 240
 - bubbler, 289 – 290
 - concentration in D_2O , 239
 - committed dose, 235, 238, 241, 244 – 245
 - DAC, 240
 - decay, 48, 236
 - dose calculations, 242 – 246
 - effective half-life, T_e , 240, 244

- infinity dose, 244 – 245
- measurement, 285 - 290
- physical form, 238
- portable monitor, 134, 288
- problem systems, 247
- production, 51, 237
- skin absorption, 237
- stack sampling, 372
- urine samples, 241 – 242, 341
- wetted skin, 247, 265(#18)

Unzoned areas, 291

uptake, 230

uranium, 11

Vehicle monitor, 157

ventilation, 299 – 303, 366 - 368

Waste management, 351 – 373

- gases, 359 – 360, 367 – 373
- liquids, 361 – 367
- solids, 351 – 358

weighted dose, H_W , 113, 231

weighting factor, w_T , 113 – 116

whole-body dose, H_{WB} , 113 – 117

whole-body counter, 159 – 160, 258

whole-body monitor, see full-body monitor

WORD, 383 – 384

Work control, 383 – 384

Work Permit, 384

Work planning, 383 – 405

X-rays, 79

Zoning, 290 - 294