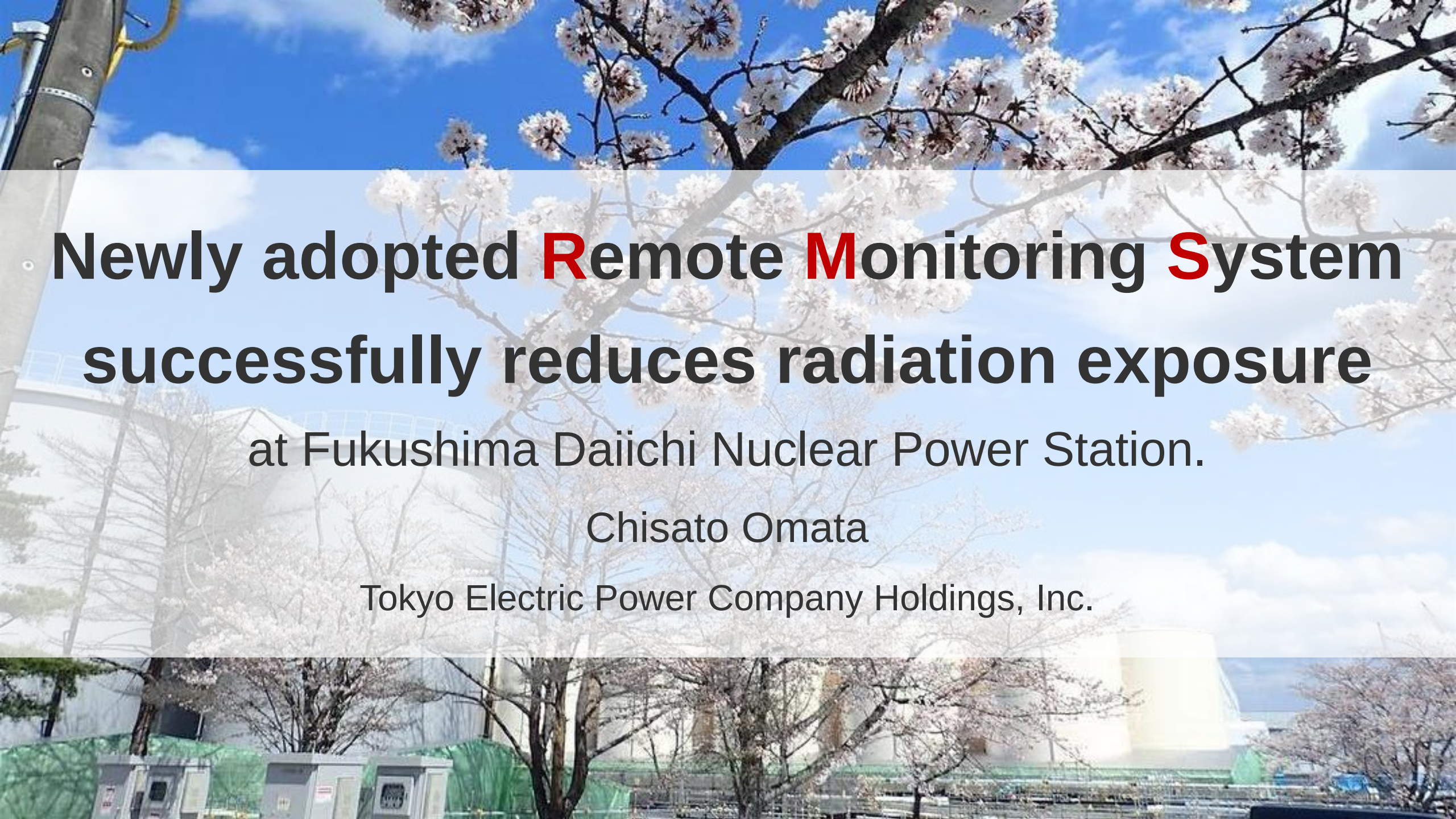


Newly adopted Remote Monitoring System successfully reduces radiation exposure

at Fukushima Daiichi Nuclear Power Station.

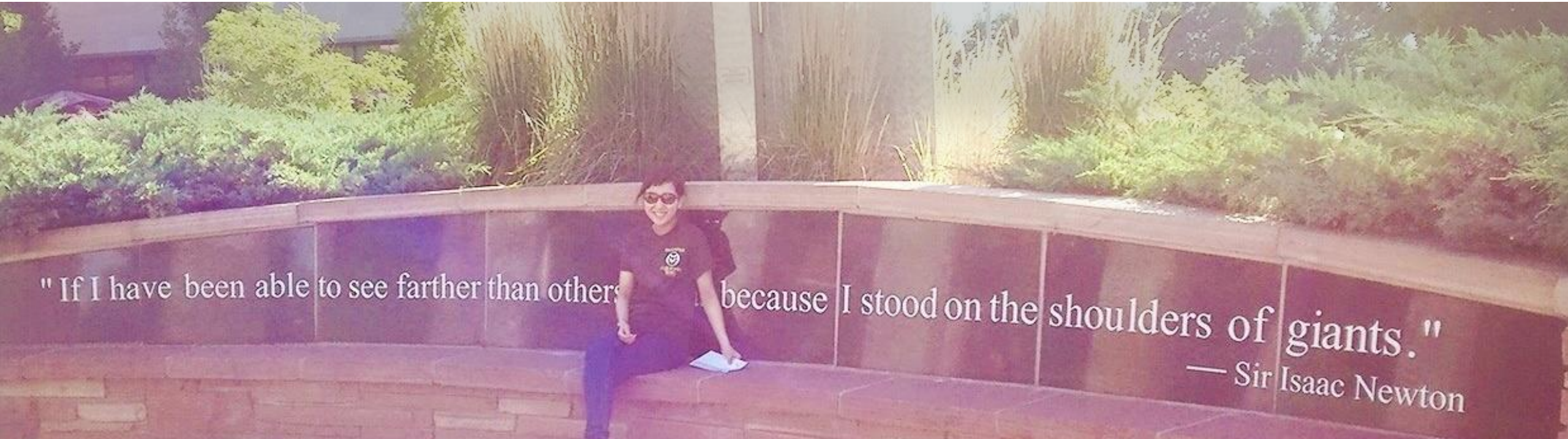
Chisato Omata

Tokyo Electric Power Company Holdings, Inc.

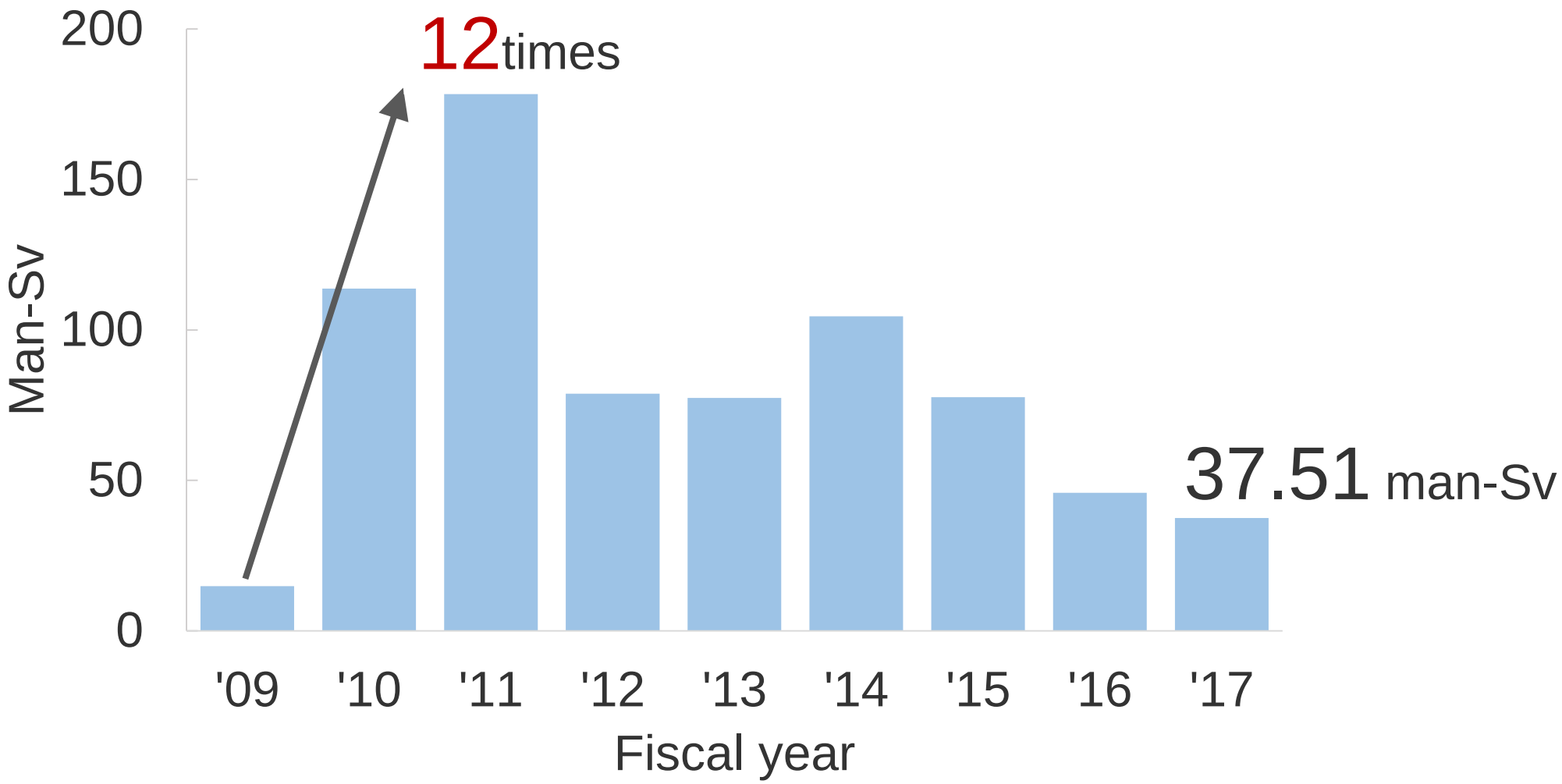
My background

- Chisato Omata (23)
- 2013.4～2017.3: Fukushima Univ. & Colorado state Univ.

  Interested in how radiation effects to my body.
- 2017.4 ~ now: Radiation management group on 1F

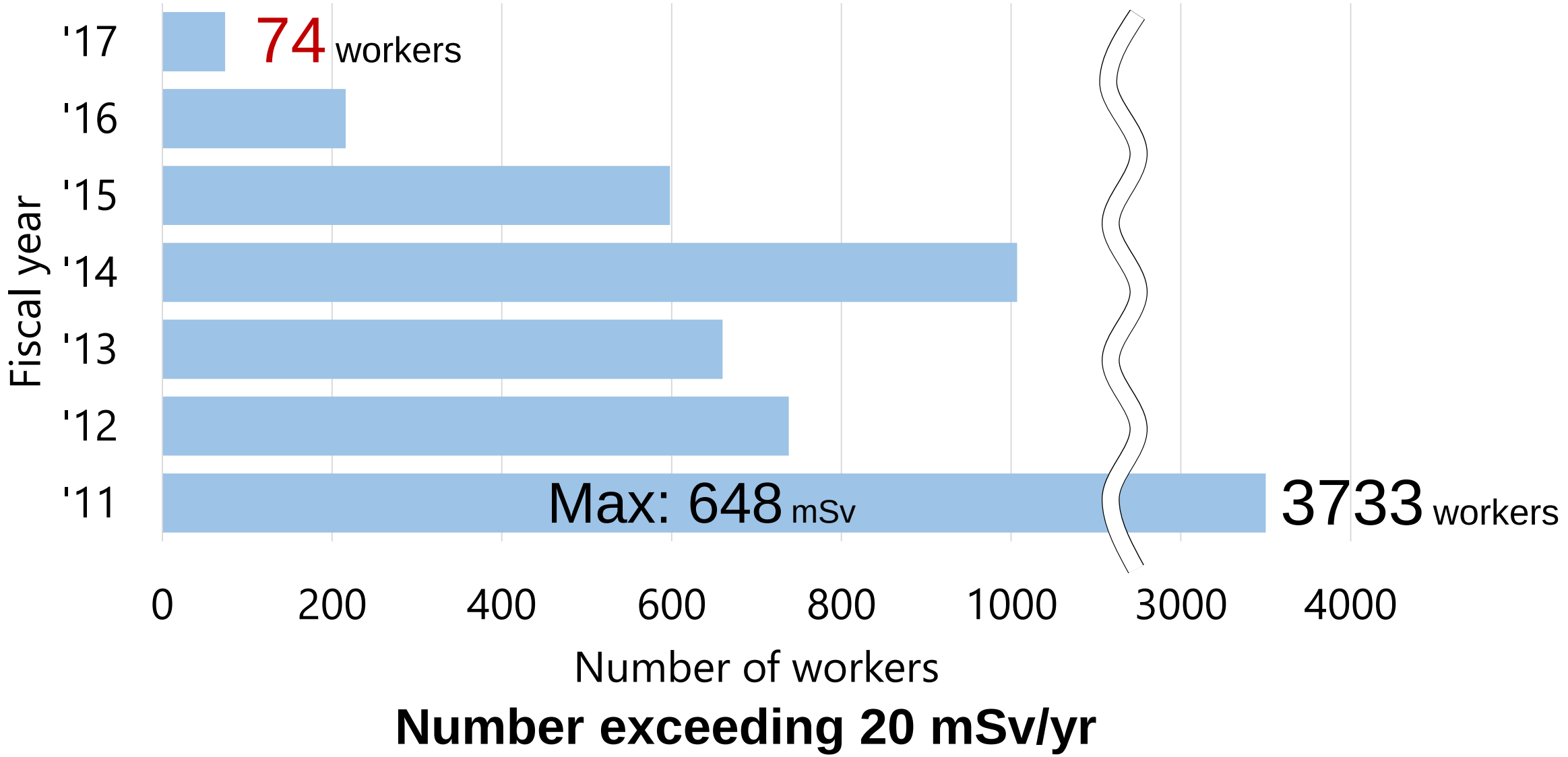


Status of Radiation Exposure at 1F



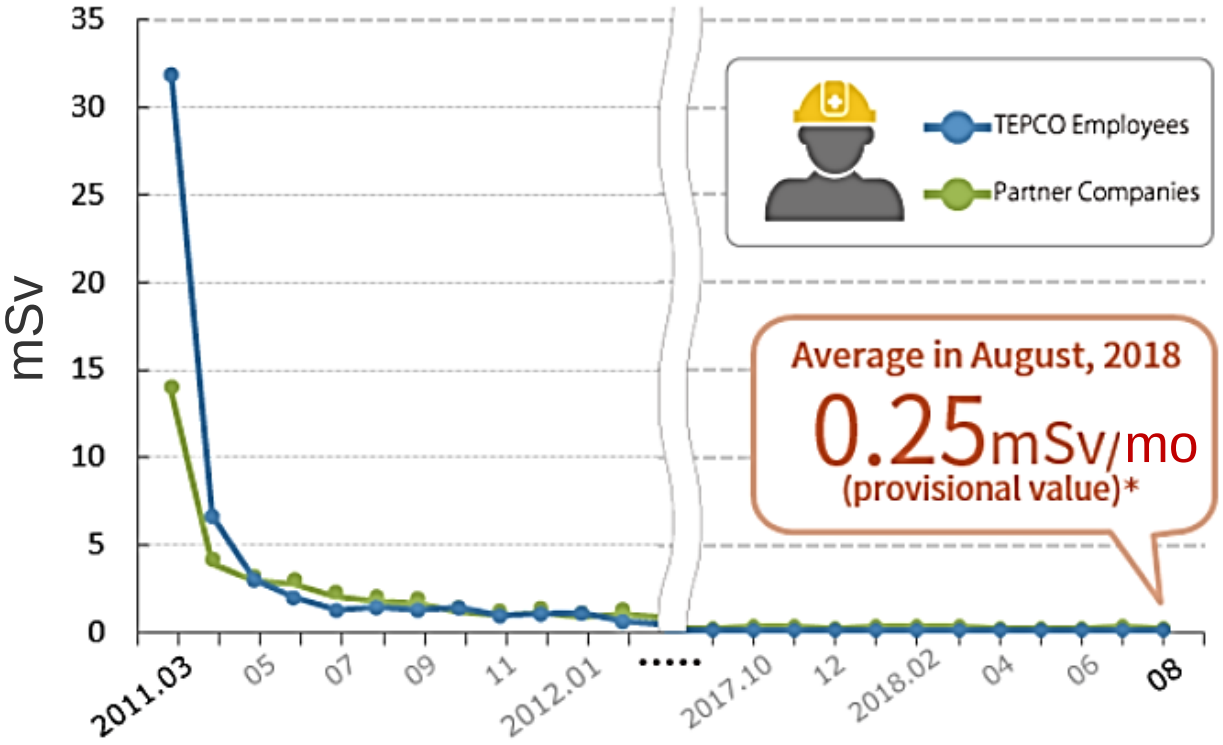
Total dose

Individual dose



Number exceeding 20 mSv/yr

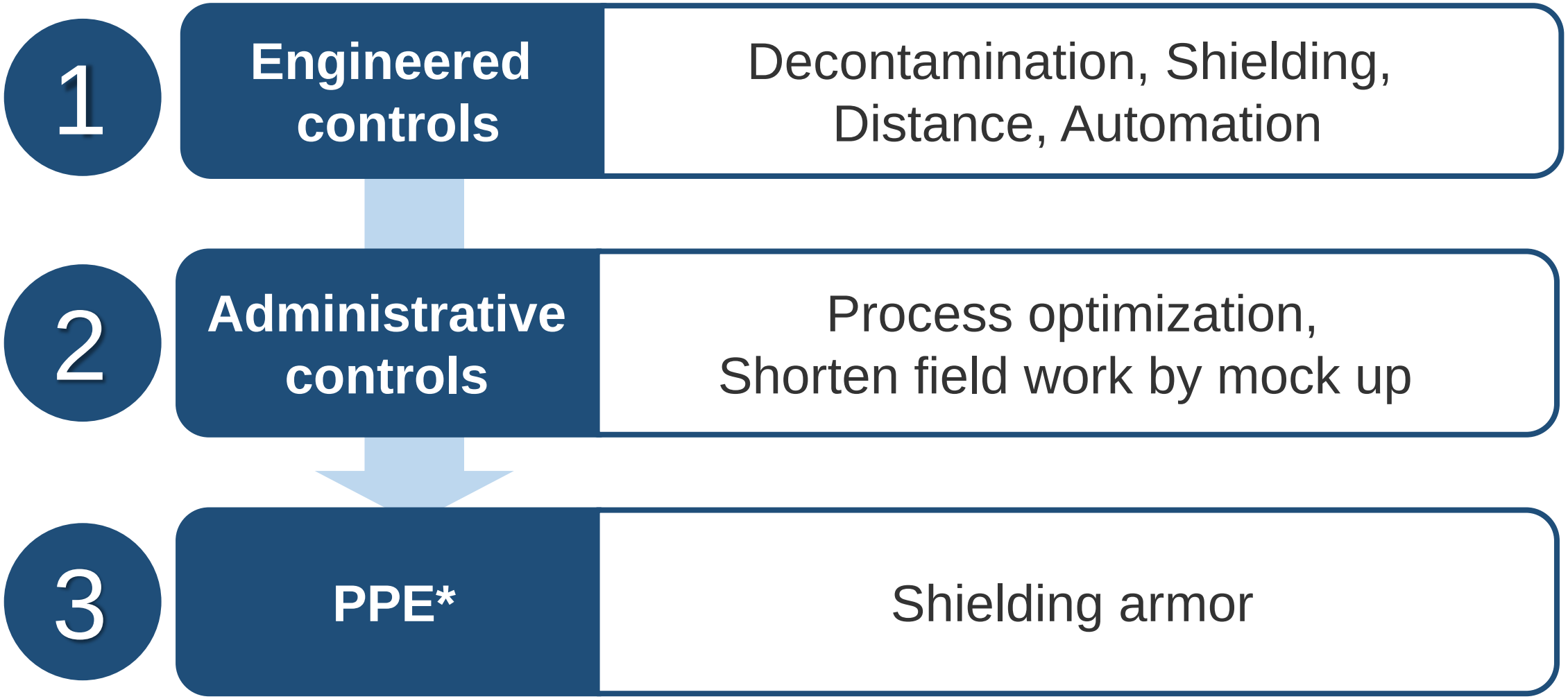
Our Mission



Monthly Dose to Individual Workers

Necessary to develop and implement **effective** radiation reduction systems.

The hierarchy of control measures



***Personal Protective Equipment**

Decontamination status of Unit-3

Install shield remotely

Unit-3 R/B 1st Floor

20-100 mSv/h

↓

6-25 mSv/h

Still high

Unit-3 R/B 5th Floor

500 mSv/h or more

↓

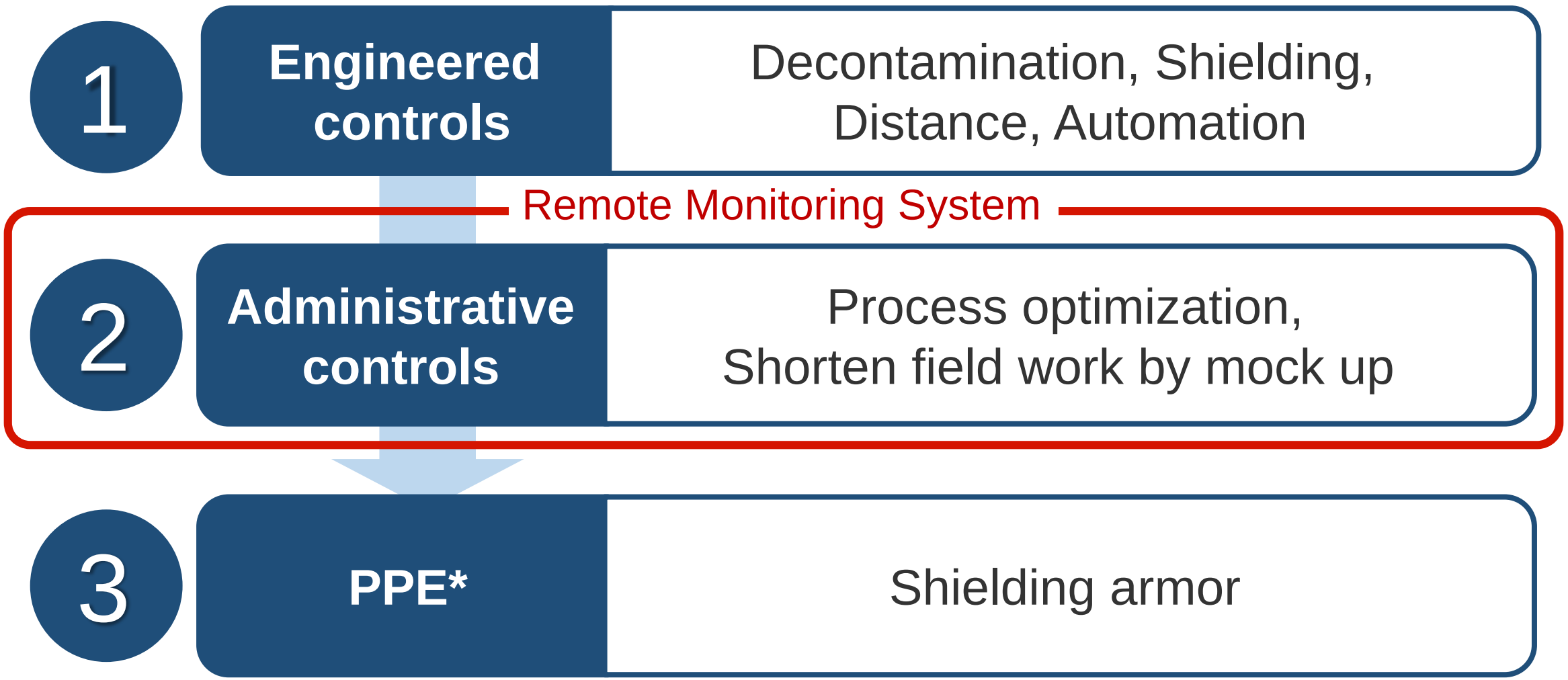
1 mSv/h or less

Why did we introduced RMS?

Occasionally need humans for precision work due to limited accessibility for remote robots.

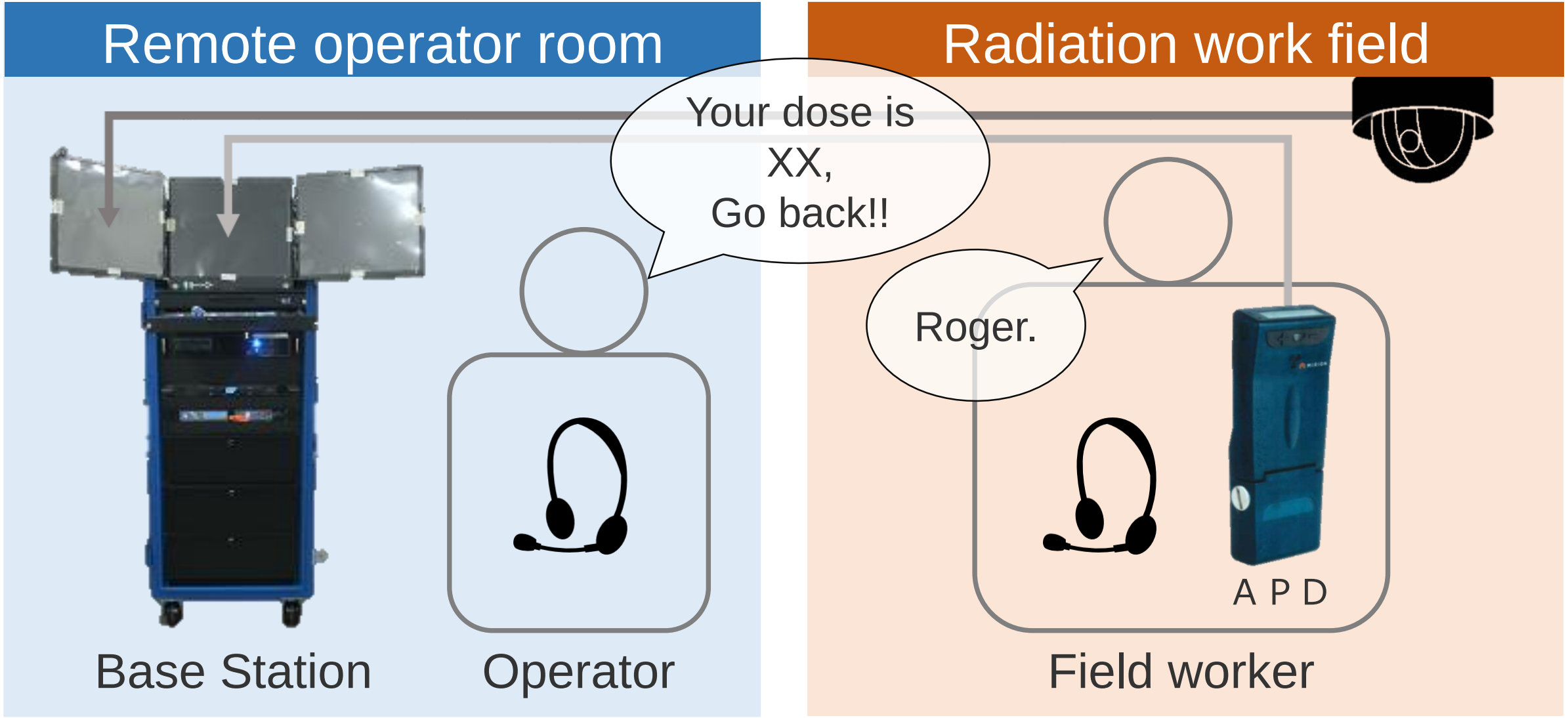
RMS is particularly effective for people working in high radiation areas.

The hierarchy of control measures

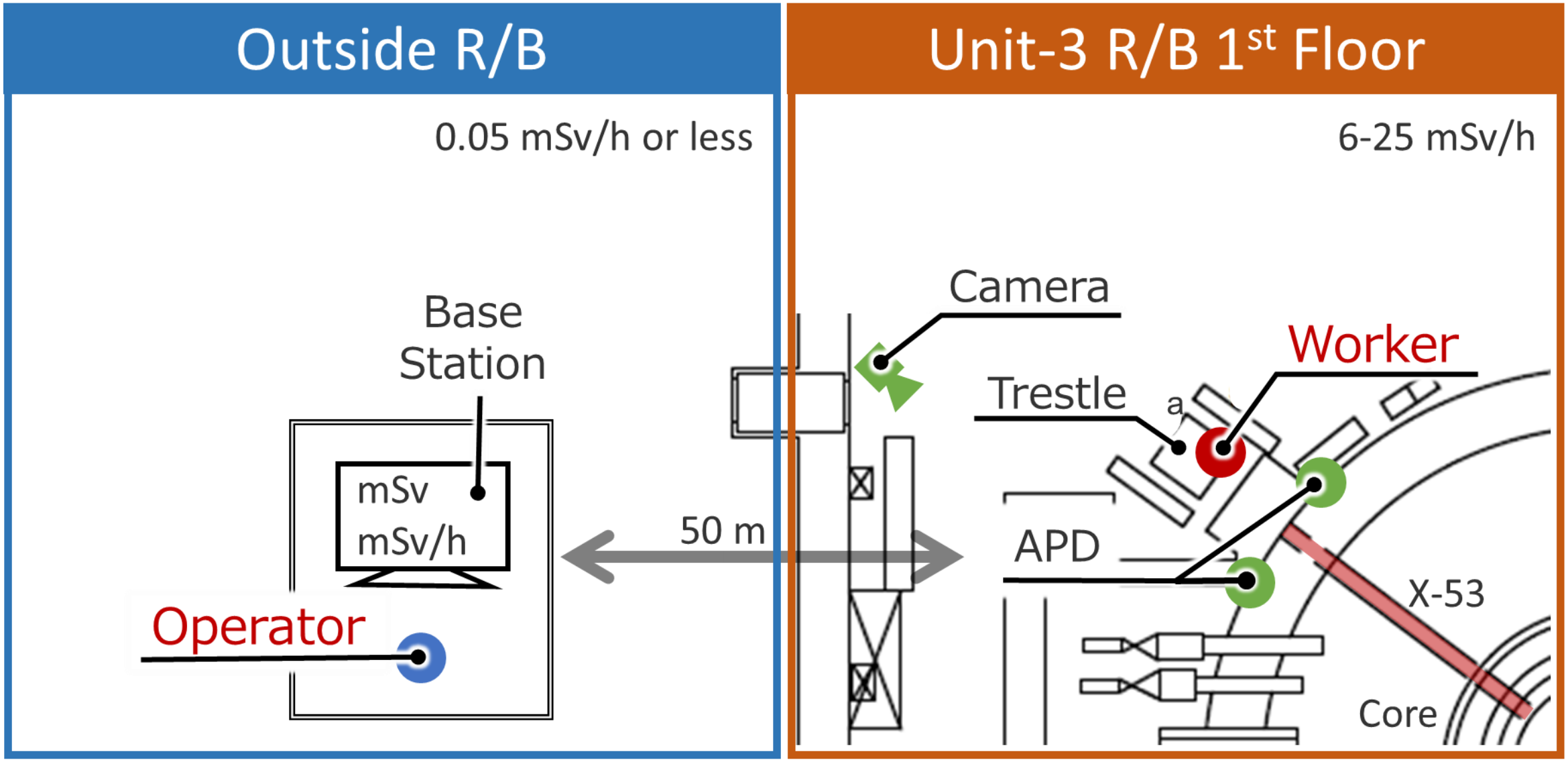


***Personal Protective Equipment**

System Overview



Unit-3 PCV (Primary Containment Vessel) Survey



Base Station

Name	RWStatus	Rate mSv	RateLim	MaxRate	Dose mSv	DoseLim	StayTime
X-53	18 DSA	24.70	100	32.40	15.69	2	00:00:00
X-6kutai	17 DSA	15.00	50	27.60	8.55	2	00:00:00
gadai	16 DSA	8.74	50	18.80	5.33	2	00:00:00
TEPCO Worker	201 DRA	700000	200	0	0.509	50	00:00:00
TEPCO Worker	201 CON	0.7	200	0	0	50	
07	07 CON	0.09	50	23.30	1.22	2	
01	01 CON	0.11	50	16.80	0.51	2	
06	06 CON	0.05	50	25.80	0.54	2	

Evaluation of radiation dose reduction with RMS.

Estimated Result

545.77 → 472.40 man-mSv

73.37 man-mSv

Reduction

- Reduce time to check own dose.
- Measure the radiation environment automatically.

A previous way to check dose manually.

Opinions by partners companies

- Operator:
  - ➢direct and notify when workers close to hot spot.
  - ➢monitor personal doses in real time.
- RP: record the field dose rate without human work.

- ✓ Want lighter and smaller device.
- ✓ Need APD batteries to last longer.
- ✓ Display needs to be in Japanese.

Conclusions and Future directions

Conclusions

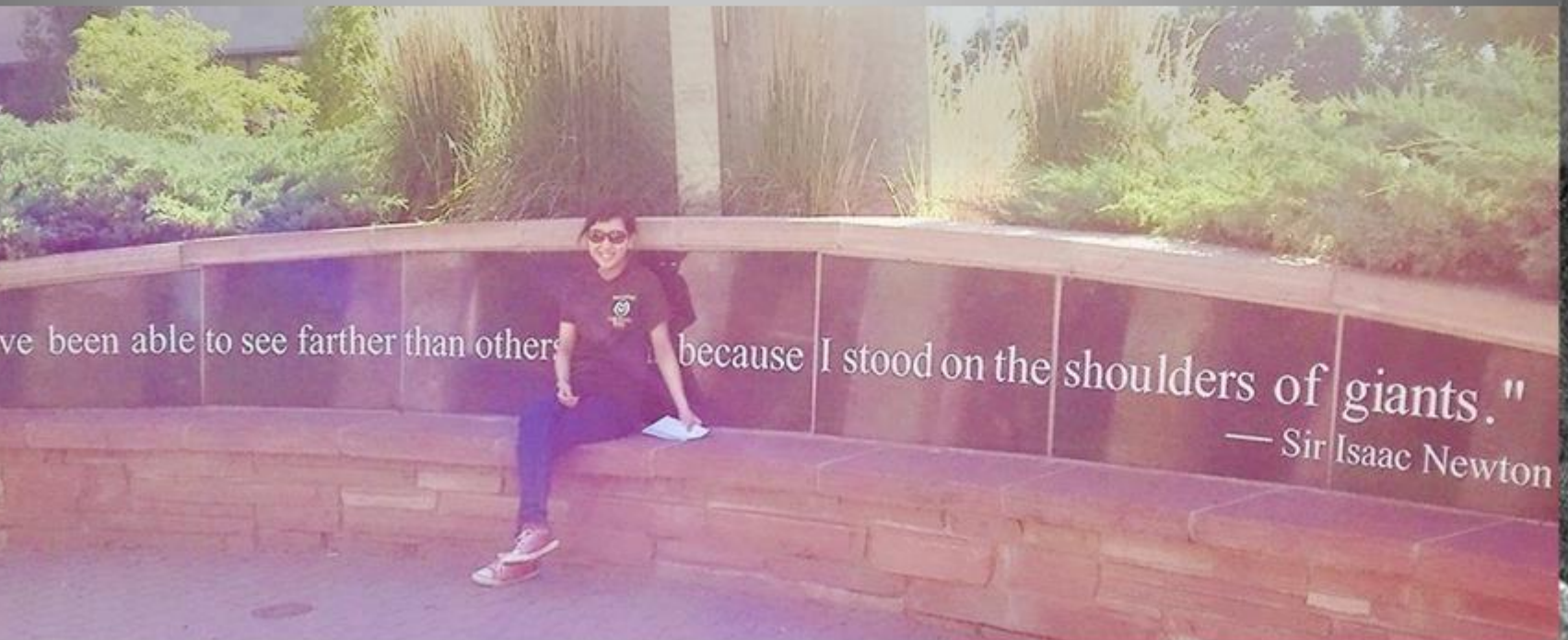
- RMS successfully reduced workers dose for Unit-3 PCV Survey.
- Confirmed RMS is effective for reducing worker dose when there is limited robotic access.

Future directions

- Will install more RMS for other work.
- Wearable display will be developed to notify workers of their dose in real time.

If I have seen further than others,
it is because I stood on the shoulders
of giants.

— Sir Isaac Newton



Thank you