



ENHANCEMENT OF THE MALAYSIAN RESEARCH REACTOR INTEGRATED MANAGEMENT SYSTEM

Mazleha Maskin
Reactor Quality Management,
Reactor Technology Center
Malaysian Nuclear Agency





Introduction of RTP



RTP-MS Enhancement



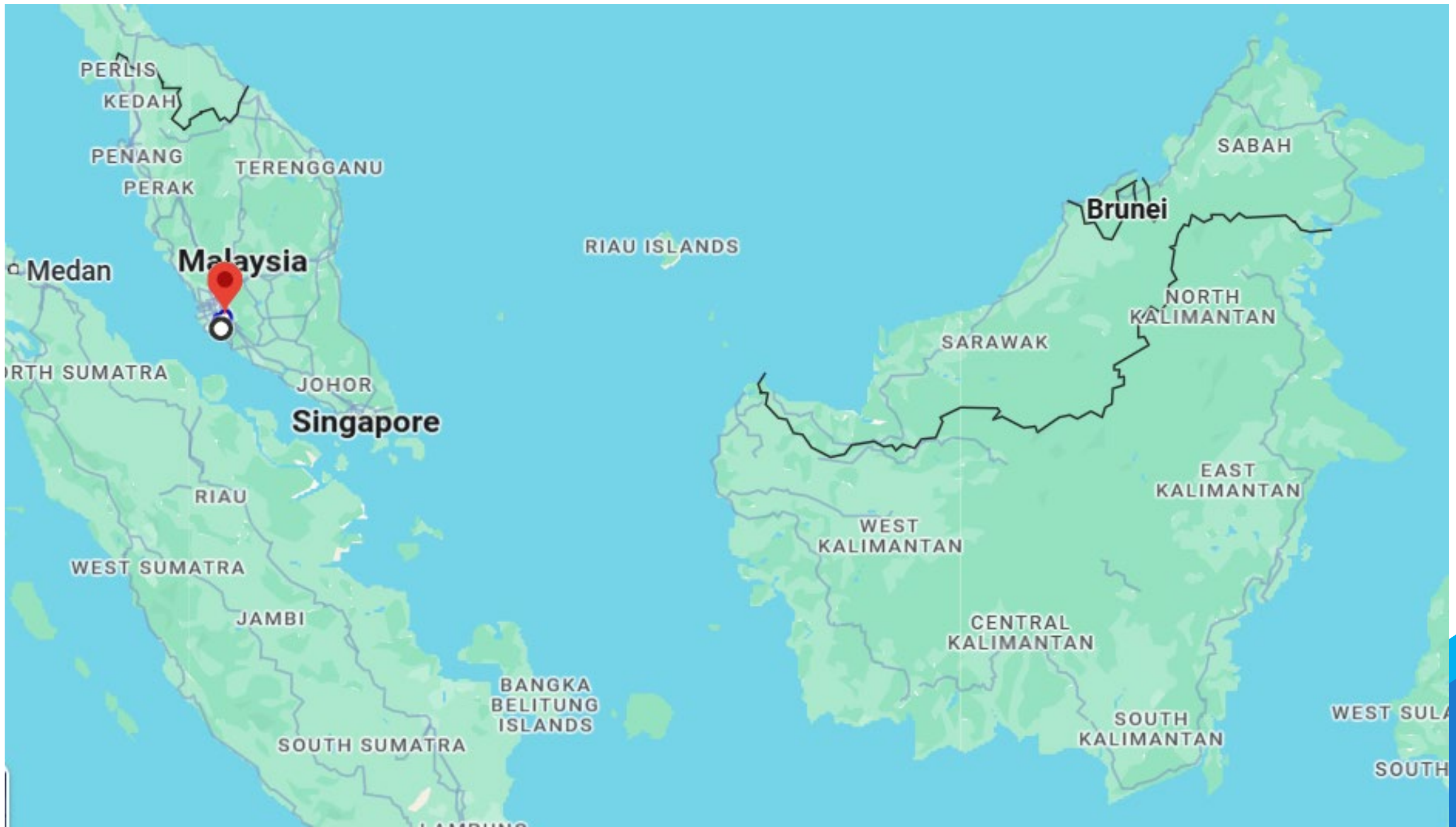
Conclusion



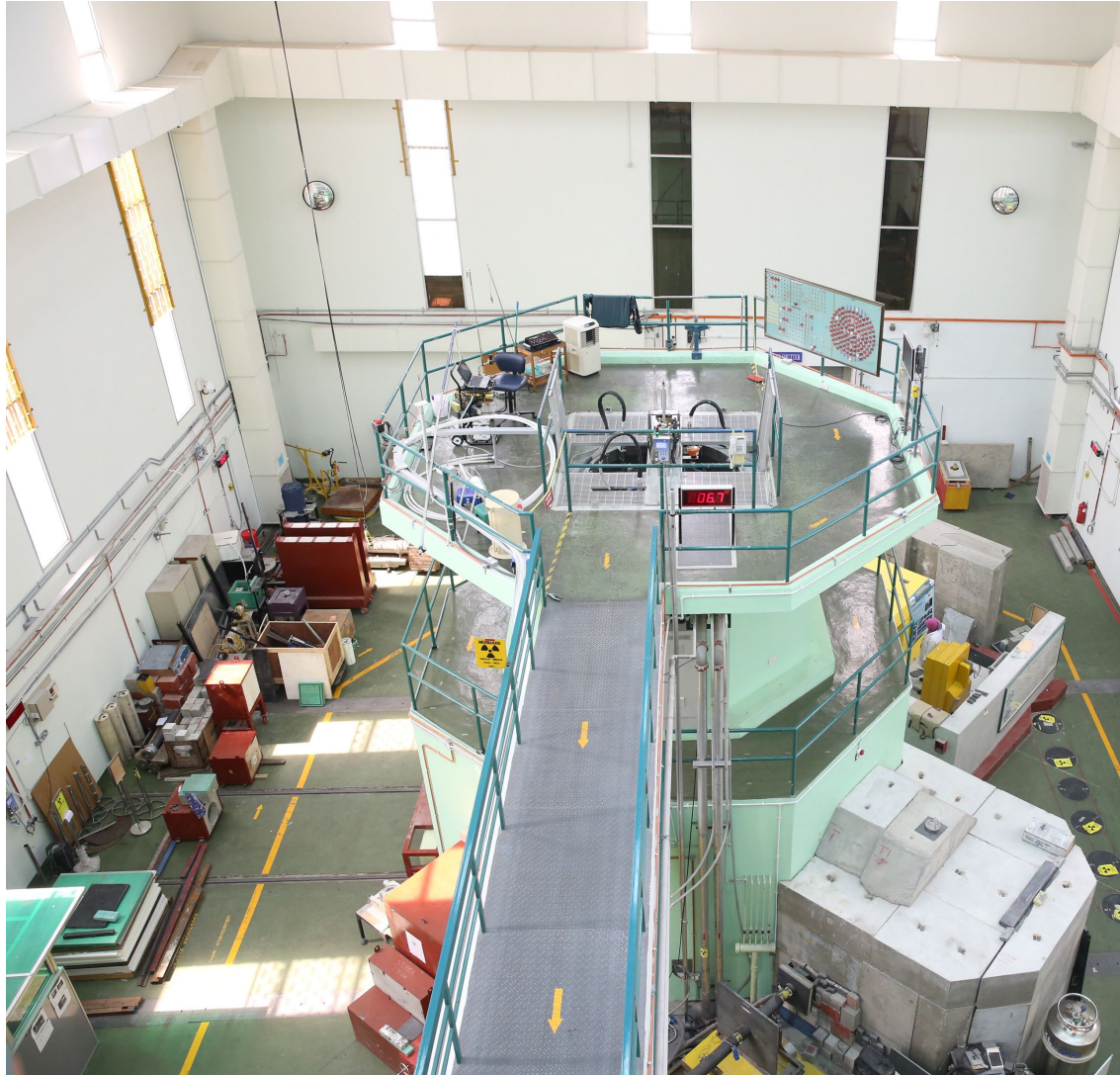
01

TOPIC 1:

INTRODUCTION TO RTP



OVERVIEW OF REACTOR PUSPATI TRIGA (RTP)



TRIGA MARK II Pool-type
First Criticality : 28th June 1982

Power

1MWth (Steady State)

Neutron Flux

$1 \times 10^{13} \text{ ncm}^{-2}\text{s}^{-1}$ (max)

Fuel

U-ZrH_{1.6} (8.5%wt, 12%wt, 20%wt)
Enrichment 19.9%
Maximum Fuel Temperature 500°C

Coolant & Moderator

Demineralized water
Maximum Coolant Temperature 45°C

Core Cooling

Natural convection

Heat Rejection

Primary cooling system
Secondary cooling system

Reflector

Graphite

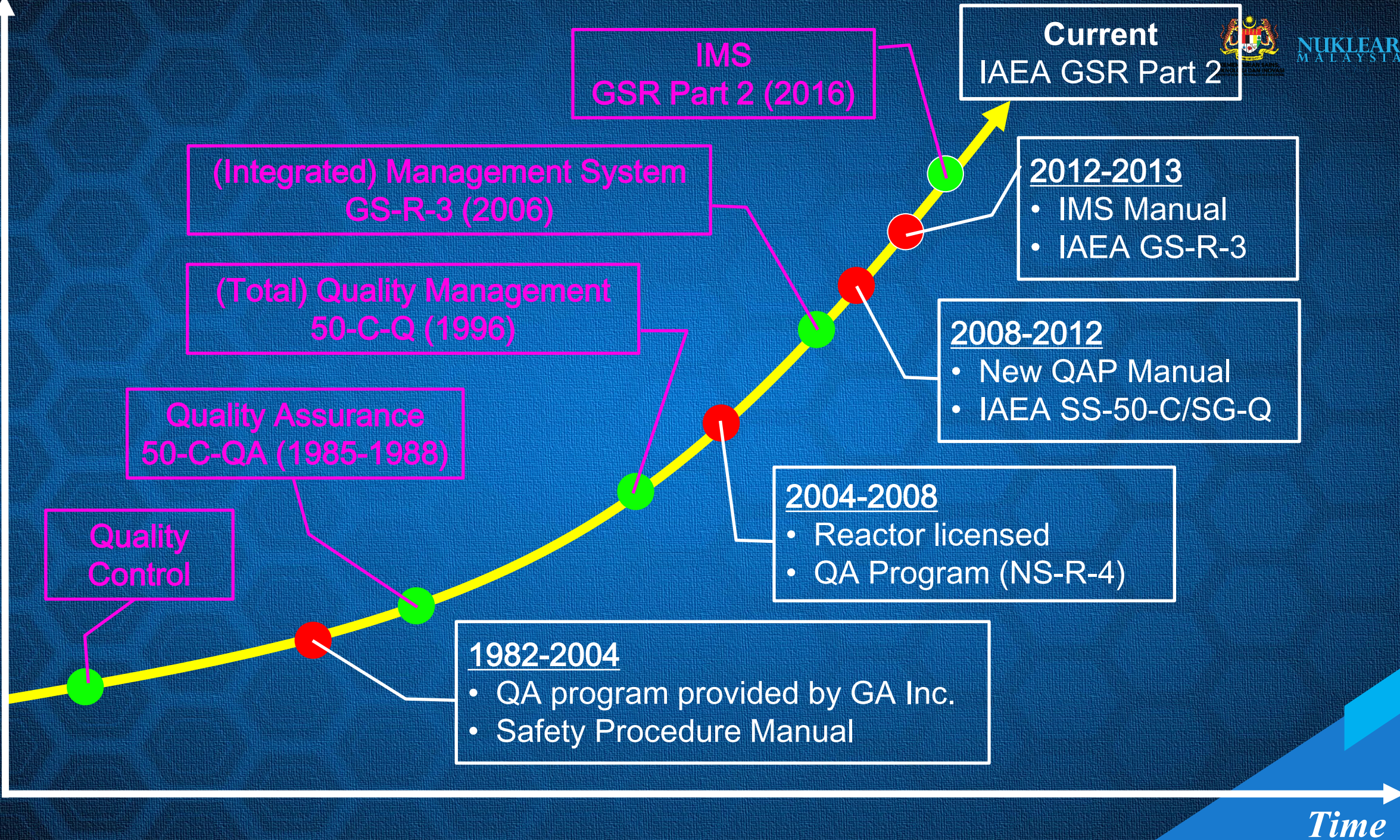
Control rod

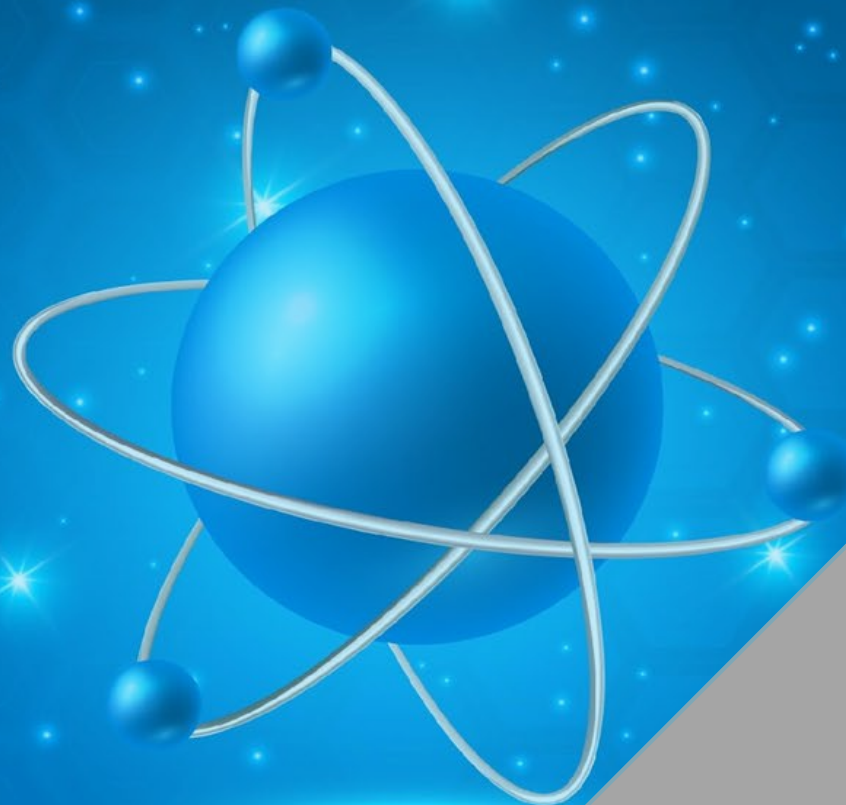
B₄C
4 rods (TR, SF, SH, REG)

Safety & Performance



NUKLEAR
MALAYSIA





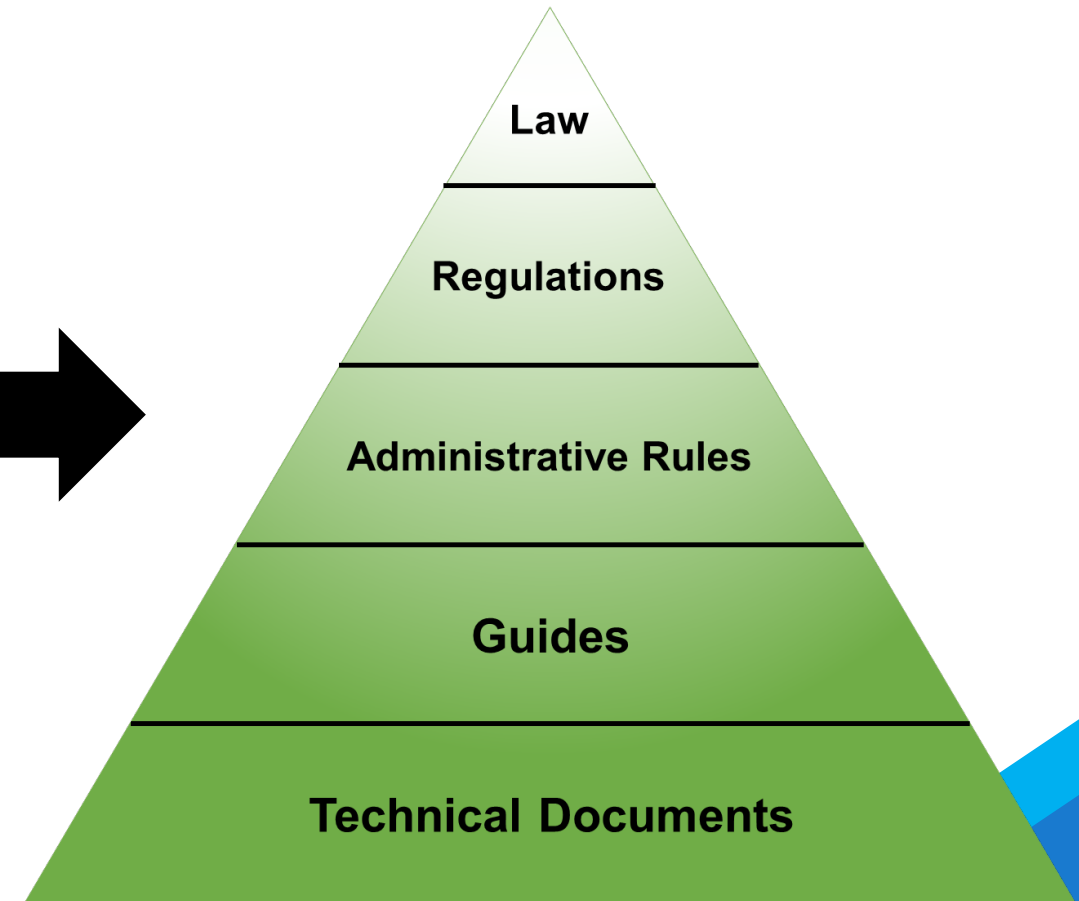
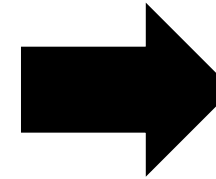
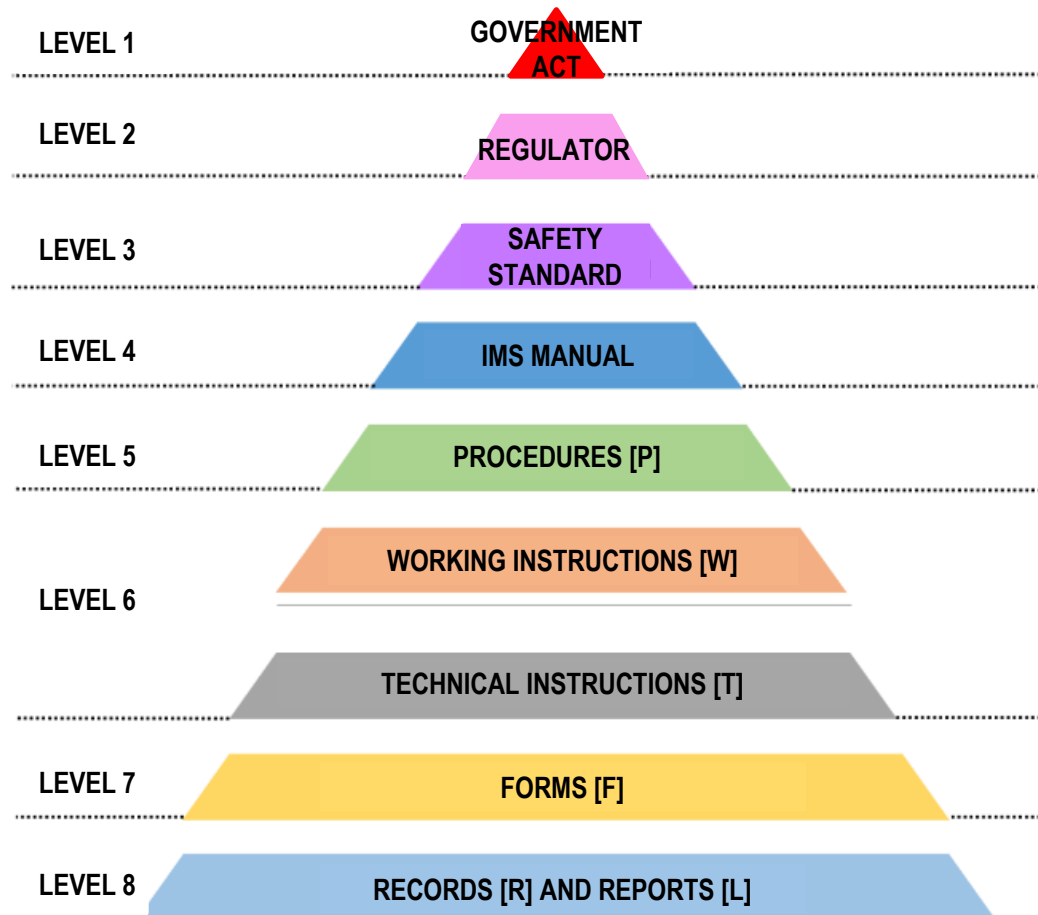
02

TOPIC 2:

RTP-MS ENHANCEMENT

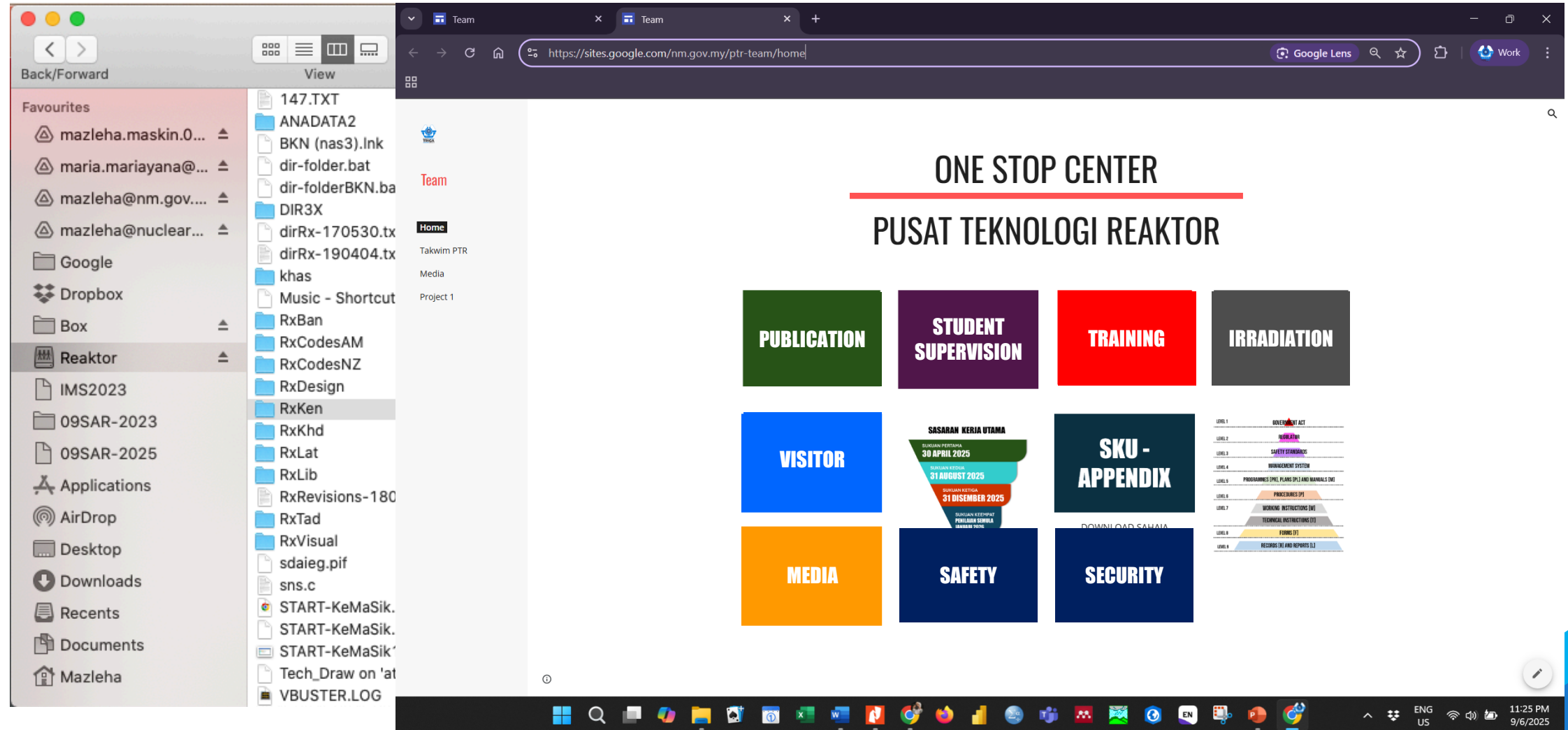
RTP-MS ENHANCEMENT

1- Management Hierarchy



RTP-MS ENHANCEMENT

2- RTP-MS Online



The screenshot displays a desktop environment with a file explorer on the left and a web browser on the right.

File Explorer (Left):

- Favourites:** mazleha.maskin.0..., maria.mariayana@..., mazleha@nm.gov..., mazleha@nuclear..., Google, Dropbox, Box, Reaktor.
- Reaktor Folder Contents:**
 - 147.TXT
 - ANADATA2
 - BKN (nas3).lnk
 - dir-folder.bat
 - dir-folderBKN.ba
 - DIR3X
 - dirRx-170530.tx
 - dirRx-190404.tx
 - khas
 - Music - Shortcut
 - RxBan
 - RxCodesAM
 - RxCodesNZ
 - RxDesign
 - RxKen
 - RxKhhd
 - RxLat
 - RxLib
 - RxRevisions-180
 - RxTad
 - RxVisual
 - sdaieg.pif
 - sns.c
 - START-KeMaSik.
 - START-KeMaSik.
 - START-KeMaSik'
 - Tech_Draw on 'at
 - VBUSTER.LOG

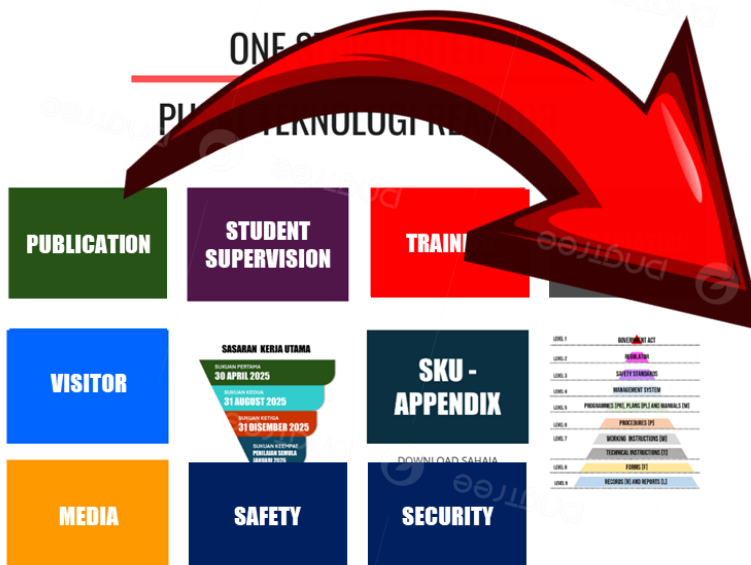
Web Browser (Right):

- Address Bar:** <https://sites.google.com/nm.gov.my/ptr-team/home>
- Page Title:** ONE STOP CENTER
- Page Content:**
 - PUSAT TEKNOLOGI REAKTOR**
 - Navigation Menu:** PUBLICATION, STUDENT SUPERVISION, TRAINING, IRRADIATION, VISITOR, MEDIA, SAFETY, SECURITY.
 - Central Banner:** SASARAN KERJA UTAMA, 30 APRIL 2025, 31 AUGUST 2025, 31 DISEMBER 2025.
 - Right Sidebar:** SKU - APPENDIX, DOWNLOAD SAHAJA.

RTP-MS ENHANCEMENT

2- RTP-MS Online

PUBLICATIONS



| Tahun Penerbitan | Jenis Penerbitan | COUNTA of Jenis Penerbitan |
|--------------------|--|----------------------------|
| 2022 | Jurnal berimpak (WoS / Scopus) | 13 |
| | Lain-lain (buku, dll) | 1 |
| | Seminar / Konferens | 2 |
| | Tesis | 1 |
| 2022 Total | | 17 |
| 2023 | Jurnal berimpak (WoS / Scopus) | 8 |
| | Laporan Teknikal (Penganjuran Bengkel, Kursus, Projek, FYP, LI, dll) | 2 |
| | Seminar / Konferens | 2 |
| | Tesis | 1 |
| 2023 Total | | 13 |
| 2024 | Jurnal berimpak (WoS / Scopus) | 2 |
| | Seminar / Konferens | 3 |
| 2024 Total | | 5 |
| Grand Total | | 35 |

| Tahun Penerbitan | Jenis Penerbitan | COUNTA of Jenis Penerbitan |
|--------------------|--|----------------------------|
| 2025 | Jurnal berimpak (WoS / Scopus) | 3 |
| | Lain-lain (buku, dll) | 3 |
| | Laporan Teknikal (Penganjuran Bengkel, Kursus, Projek, FYP, LI, dll) | 5 |
| | Seminar / Konferens | 3 |
| 2025 Total | | 14 |
| Grand Total | | 14 |

RTP-MS ENHANCEMENT

2- RTP-MS Online

STUDENT SUPERVISION

ONE STOP CENTER
PUSAT TEKNOLOGI REAKTOR



PUBLICATION

STUDENT SUPERVISION

TRAINING

IRRADIATION

VISITOR

SASARAN KERJA UTAMA

30 APRIL 2025

31 AUGUST 2025

31 DESEMBER 2025

Table1

Timestamp

Nama Pegawai Penyelia

MEDIA

SAFETY

| COUNTA of Kategori | | Kategori | | | | | |
|--------------------|------------|----------|----|-----|-----|-------------|--|
| Tarikh Mula - Year | | FYP | LI | MSc | PhD | Grand Total | |
| + | 2021 Total | | 6 | 1 | | 7 | |
| + | 2022 Total | 4 | 7 | 1 | | 12 | |
| + | 2023 Total | 3 | 11 | 1 | 2 | 17 | |
| + | 2024 Total | | 5 | 2 | 2 | 9 | |
| + | 2025 Total | | | 2 | 3 | 5 | |
| Grand Total | | 7 | 29 | 7 | 7 | 50 | |

| | | | | | | | | | |
|---------------------|------------------------|---|------|-----|------------|------------|--|-----------------------------|--|
| 03/09/2021 13:53:24 | Nurhayati binti R | | | | | | | | |
| 03/09/2021 18:28:50 | Mark Dennis, Dr | | | | | | | | |
| 03/09/2021 18:33:17 | Mark Dennis, Dr | SITI HAWA BINTI SALAMAT | UTM | LI | 12/07/2021 | 27/09/2021 | Neutron activation analysis and radiation dose calculations with OpenMC: Super critical water reactor neutron parameters | DR. NOR EZZATY AHMAD | |
| 03/09/2021 18:55:00 | Mark Dennis, Dr | Kiren Emmanuel Anbalagan | UTM | LI | 12/07/2021 | 27/09/2021 | | Dr. Norehan Binti Mohd Nor | |
| 09/02/2022 10:31:27 | Naim Syauqi bin Hamzah | Ayu Sofia Shaari | UiTM | LI | 11/10/2021 | 28/01/2022 | Ensuring Safety and Enhancing Utilization of Nuclear Research Reactor | Syamsir Akmal Senawi | |
| 09/02/2022 10:33:22 | Naim Syauqi bin Hamzah | Nurhidayatul Amirah Suhaimi | UiTM | LI | 11/10/2021 | 28/01/2022 | Ensuring Safety and Enhancing Utilization of Nuclear Research Reactor | Syamsir Akmal Senawi | |
| 21/04/2022 13:30:51 | Mazleha Maskin | Nik Qurrotu Ain binti Nik Ahmad Nasruddin | UKM | FYP | 04/04/2022 | 31/01/2023 | Fire PSA: Control Room | Prof. Dr. Faizal Mohamed | |
| | | | | | | | Portable Gamma Shielding | Dr. Muhammad Imran Mustafak | |

RTP-MS ENHANCEMENT

2- RTP-MS Online

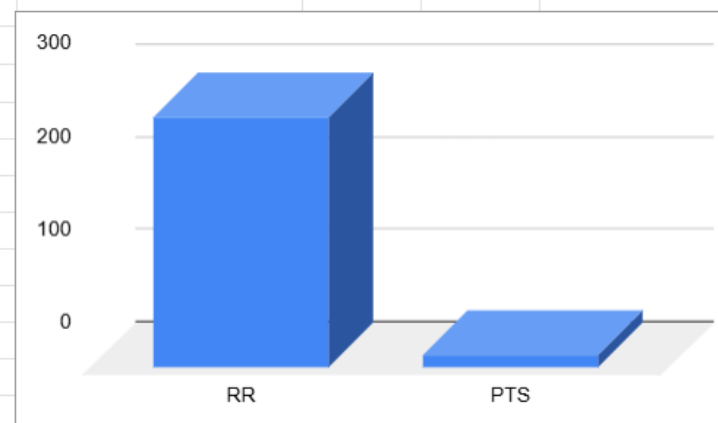
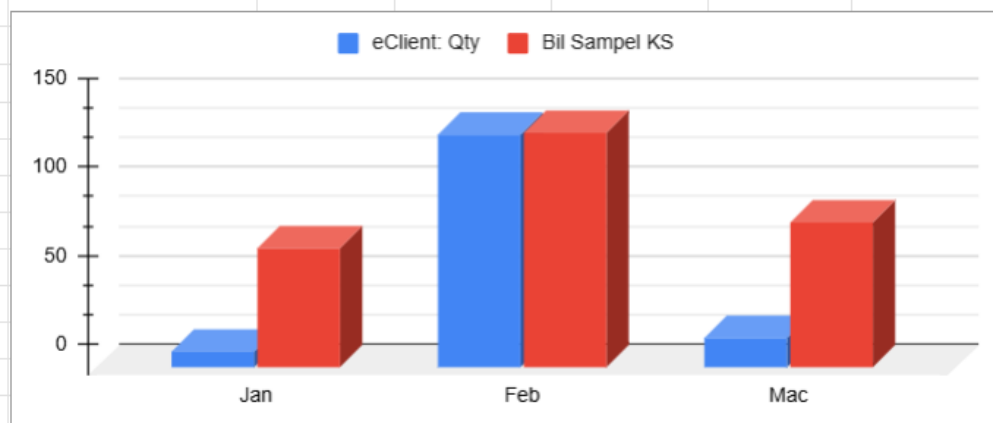
RTP-R-30: Rekod Penyinaran Sampel



Menu 100% 123 Default... 10 B I A

Summarise this table

| | A | B | C | D | E | F | G | H | I | J |
|----|--------------------|-------------------|-------------|-----------------|--------------------|---------------------|--------------|---------------|-------------------|----------|
| 1 | | MUH/NFH/ABI/MHH | | | | eClient: Kuantiti | | NFH/ABI/MHH | | |
| 2 | No RFQ | No. Pesanan / KS# | Catatan | Jenis Sampel | No Sebutharga | Nama Pelanggan | eClient: Qty | Bil Sampel KS | Tarikh disinarkan | Facility |
| 64 | NM/RFQ/2025-001163 | 056/25 (1) | 39L/25-RICH | MINERALS Zircon | NM/QUO/2025-002098 | EZWIZA BINTI SANURI | 4 | 4 | 14 May 2025 | RR |



| NM/QUO/2025-000016 | No. Pesanan | SUM of eClient | SUM of Bil Sar | SUM of eClie | SUM of KS# |
|--------------------|-------------|----------------|----------------|--------------|------------|
| + Jan Total | | 9 | 67 | 450.00 | 3,350.00 |
| + Feb Total | | 131 | 132 | 6,550.00 | 6,600.00 |
| + Mar Total | | 16 | 81 | 800.00 | 4,050.00 |
| + May Total | | 50 | 103 | 0.00 | 400.00 |
| + Jun Total | | 20 | 78 | 0.00 | 0.00 |
| + Total | | 374 | 0 | 16,050.00 | 0.00 |
| Grand Total | | 600 | 461 | 23,850.00 | 14,400.00 |

| SUM of Bil Sampel KS | Facility | | |
|---------------------------|----------|-----|-------------|
| Tarikh disinarkan - Month | PTS | RR | Grand Total |
| Jan | | 67 | 67 |
| Feb | | 132 | 132 |
| Mar | 12 | 69 | 81 |
| May | 31 | 72 | 103 |
| Jun | 42 | 36 | 78 |
| Grand Total | 85 | 376 | 461 |

| Jenis Sampel | SUM of Bil Sampel KS |
|---------------------------|----------------------|
| bahan mineral (Amang) | 24 |
| Debris | 35 |
| Flora | 13 |
| GYPSUM | 66 |
| Holmium-165 | 22 |
| Holmium-166 | 13 |
| Holmium-167 | 1 |
| Holmium-168 | 1 |
| Holmium-169 | 1 |
| Ikan | 3 |
| ilmenite dan ilmenit slag | 12 |
| Iron Oxide | 3 |
| MINERAL Zircon Sand | 15 |
| MINERALS Zircon | 2 |
| multielement | 4 |
| Pasir | 30 |
| Residue | 27 |
| Sampel tanah dan rumput | 11 |
| | 29 |

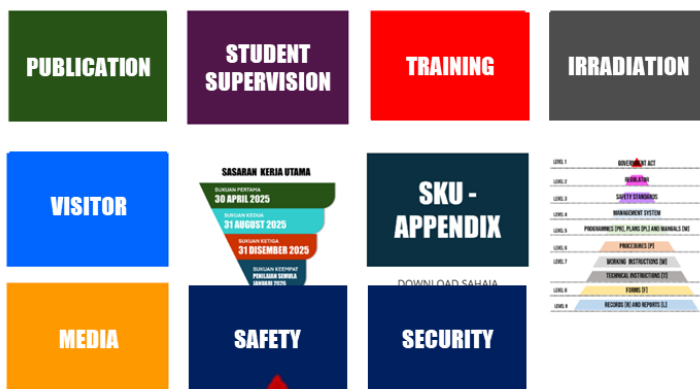
RTP-MS ENHANCEMENT

2- RTP-MS Online

SAFETY

ONE STOP CENTER

PUSAT TEKNOLOGI REAKTOR



| A | B | C | D | E | N | O | Q | R | S |
|-----|----------------------------------|------------------|---|--------------|--------------|-----------------------|---|---|----|
| Nos | Nama Pelapor | Date of Incident | Title | Status | No. IMS OPEN | Status | | | |
| 1 | Muhammad Husamuddin Abdul Khalil | 26-May-25 | Insiden pen dosimeter pelawat terjatuh ke dalam kolam reaktor | BELOM REVIEW | | Belom Review | | | 2 |
| 2 | Phongsakorn Prak Tom | 24-Apr-25 | Power Supply 1 in DACS cabinet fails | BELOM REVIEW | | Reviewed | | | 14 |
| 3 | Mohd Khairulezwan Abdul Manan | 27-Sep-24 | Regulating motor driver gagal berfungsi | Yes | | Jumlah Report Anomali | | | 16 |
| 4 | Na'im Syauqi Hamzah | 24-Feb-24 | Sampel penyinaran di kemudahan PTS gagal dikeluarkan secara automatik | Yes | 009 | | | | |
| 5 | Na'im Syauqi Hamzah | 24-Jan-24 | Kegagalan pengaliran air sisa buangan di sump pit reaktor ke tangki simpanan sisa sementara WasTeC | Yes | 008 | | | | |
| 6 | Nurfariana Ayuni Joha | 13-Feb-24 | Bacaan sinaran tinggi di Bilik Pneumatik, Blok 20. | Yes | | | | | |
| 7 | Mohd Huzair Hussain | 22-Dec-23 | Limpahan air di "Bilik Penyediaan Sampel" disebabkan oleh kegagalan saluran paip air buangan sistem AHU 1 tersumbat | Yes | 007 | | | | |
| 8 | Norfarizan Mohd Said, Dr. | 22-Dec-23 | Pagar pintu bilik stor mekanikal tidak bermangga | Yes | | | | | |
| 9 | Mohd Sabri Minhat, Ts. Dr. | 18-Dec-23 | Gangguan bekalan kuasa secara berulang kali dalam masa yang singkat | Yes | | | | | |

2023







| | | | | |
|-----|-------------|---|---|-------------|
| 10. | 22 Dis 2023 | 8. <input checked="" type="checkbox"/> Norfarizan Mohd Said | Pagar pintu bilik stor mekanikal tidak bermangga | 4 Jan 2024 |
| 9. | 22 Dis 2023 | 7. <input checked="" type="checkbox"/> Mohd Huzair Hussain | Limpahan air di "Bilik Penyediaan Sampel" disebabkan oleh kegagalan saluran paip air buangan sistem AHU 1 tersumbat | 02 Jan 2024 |
| 8. | 18 Dis 2023 | 6. <input checked="" type="checkbox"/> Mohd Sabri Minhat | Gangguan bekalan kuasa secara berulang kali dalam masa yang | 22 Mar 2024 |

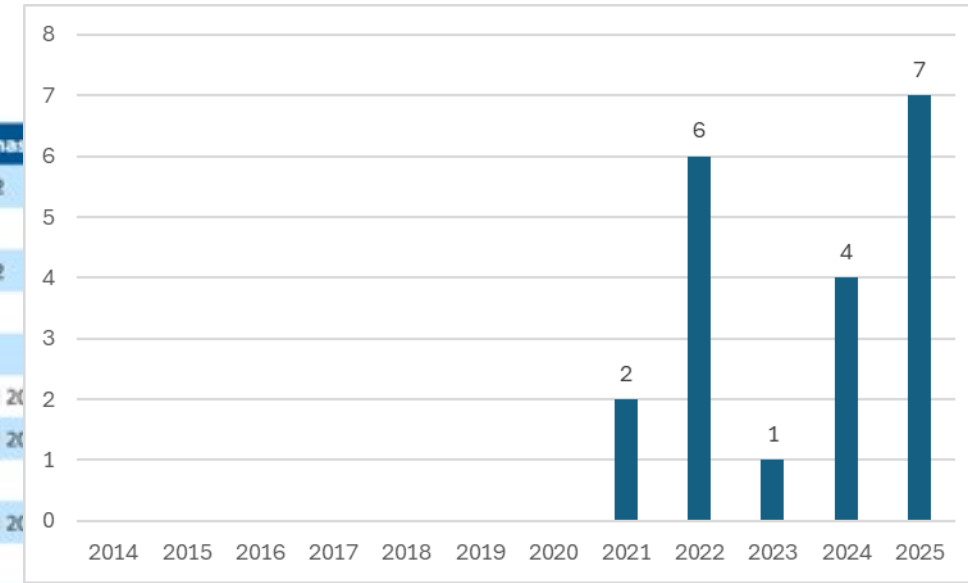
RTP-MS ENHANCEMENT

3- Developing / Modify Procedures / Instructions

Home PTR
Home RQM
IMS
Objektif IMS
Akta Kerajaan
AKTA 304
Badan Kawal Selia
AELB
IAEA
SHE-MS (localweb)
Prosedur (P)
Arahan Kerja (W)
Arahan Teknikal (T)
Borang (F)
RTP-F-9 - Separa Tahunan
RTP-F-10 - Tahunan
RTP-F-35 - Rekod Latihan
Daftar Rekod / Laporan
Document Rasmi NM
Recent
Hijrah: QAP ke IMS
AP 2021 - 2022

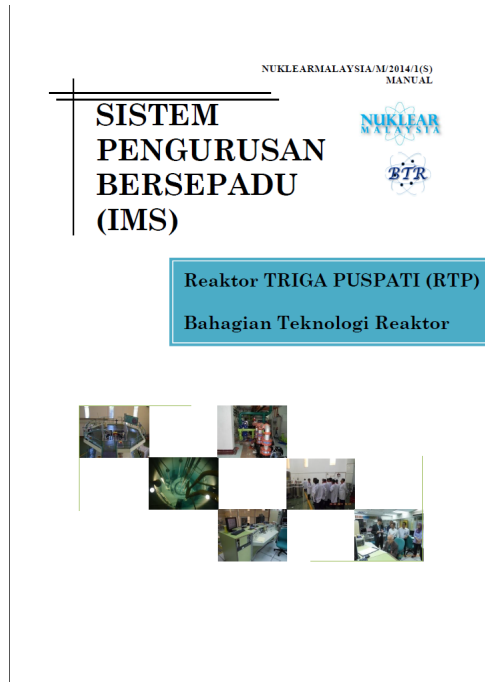
BORANG [F]

| Bil. | No. Rujukan | Dokumen | Semakan | Kemas |
|------|-------------|--|---------|----------|
| 1. | RTP-F-01 |  Borang Permohonan Akses ke Blok 20 | 1 | 2022 |
| 2. | RTP-F-02 | | | |
| 3. | RTP-F-03 |  Borang Permohonan Menggunakan Reaktor [Senarai RTP-F-03] | 1 | 2022 |
| 4. | RTP-F-04 | Borang Penyinaran Reaktor (Dalam Talian: URTP) | | |
| 5. | RTP-F-05(A) | Senarai Ujian Semasa Penyerahan Shift | | |
| 6. | RTP-F-05 |  Senarai Ujian pada Awal Kendalian Reaktor | 3 | April 20 |
| 7. | RTP-F-06 |  Senarai Ujian pada Akhir Kendalian Reaktor | 3 | April 20 |
| 8. | RTP-F-07 | | | |
| 9. | RTP-F-08 |  Pengawasan Penyenggaraan Bulanan | 2 | April 20 |
| 10. | RTP-F-09 | Pengawasan Penyenggaraan Separa Tahunan | | |
| 11. | RTP-F-10 | Pengawasan Penyenggaraan Tahunan | | |
| 12. | RTP-F-13 | Fuel Element Transfer Form | | |
| 13. | RTP-F-14 | Fuel Element History File | | |
| 14. | RTP-F-18 | Borang Laporan Kerosakan Reaktor MINT | | |
| 15. | RTP-F-22 | Jadual Kendalian Mingguan | | |
| 16. | RTP-F-24 | Senarai Khidmat Aliran Borang RTP3 dan RTP4 | | |
| 17. | RTP-F-25 | Borang Soal Seldik | | |
| 18. | RTP-F-31 | NCR | | |
| 19. | RTP-F-32 | Audit Notes | | |
| 20. | RTP-F-34 | Audit Schedule and Status | | |
| 21. | RTP-F-35 |  Employee Training and Evaluation Report | | |



RTP-MS ENHANCEMENT

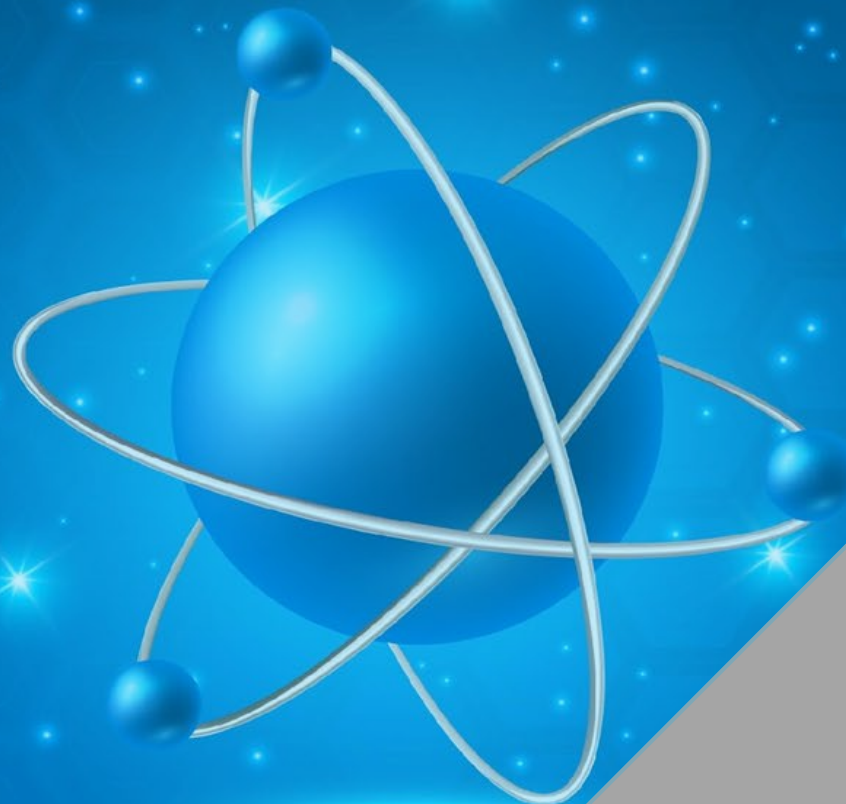
4- RTP-MS Manual Improvement



| No. | RTP-MS (2018) | New RTP-MS (2023) |
|-----|---|---|
| 1 | Introduction | Introduction |
| 2 | Definition | Definition |
| 3 | Management System | Responsibility for Safety |
| 4 | Management Responsibility | Leadership for Safety |
| 5 | Resource Management | Management for Safety |
| 6 | Process Implementation | Culture for Safety |
| 7 | Measurement, Assessment and Improvement | Measurement, Assessment and Improvement |

GS-R-3 (2006)

GSR Part 2 (2016)



03

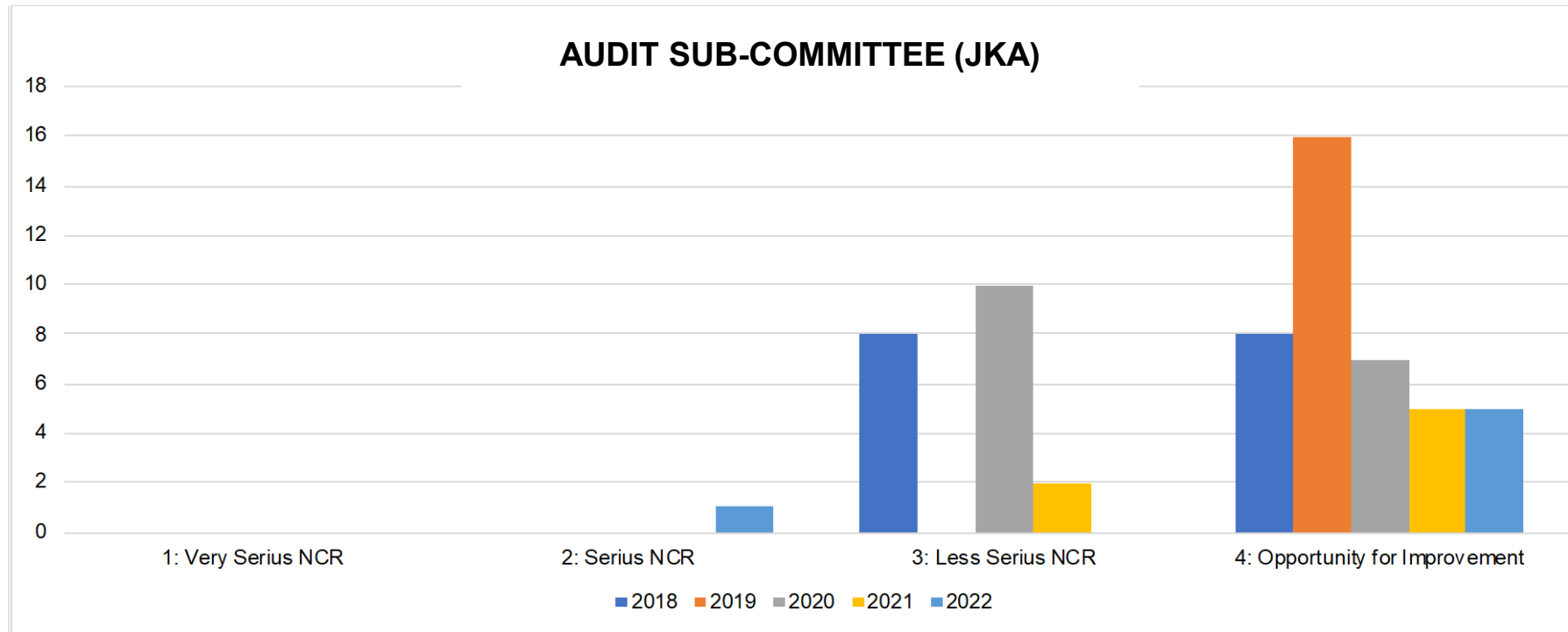
TOPIC 3:

CONCLUSION

CONCLUSION

1- Audit Documents Improvement

- Slight reduction in both numbers of corrective actions and opportunity for improvements



CONCLUSION

ONE STOP CENTER
PUSAT TEKNOLOGI REAKTOR

PUBLICATION

STUDENT SUPERVISION

TRAINING

IRRADIATION

VISITOR

SASARAN KEBERHAUTAMAAN
 30 APRIL 2025
 31 AGOST 2025
 31 DISEMBER 2025

SKU - APPENDIX

DOWNLOAD SAHAJA
 SAFETY
 SECURITY

MEDIA
 SAFETY
 SECURITY

2- Documents Retrieval Efficiency

2023 RTP-F35-RekodLatihan

File Edit View Insert Format Data Tools Extensions Help

100% 123 10

P9

RTP-F35b sem: 2/2021

NUKLEAR MALAYSIA

REKOD LATIHAN PUSAT TEKNOLOGI REAKTOR BAGI TAHUN 2023

| Bil | Nama | Bil Hari Latihan | TM | WB | SK | TR | AM |
|-----|--------------------------|------------------|----|----|----|----|----|
| 1. | JULIA ABDUL KARIM | 9.0 | 0 | 1 | 0 | 0 | 0 |
| 2. | MUHAMMAD KHAIRUL ARIFF | 12.0 | 1 | 0 | 0 | 2 | 0 |
| 3. | ABI MUTTAQIN JALAL BAYAR | 10.0 | 0 | 0 | 0 | 1 | 0 |
| 4. | NAIM SYAUQI HAMZAH | 9.9 | 0 | 1 | 3 | 1 | 0 |
| 5. | MARK DENNIS USANG | 15.0 | 0 | 0 | 0 | 2 | 0 |
| 6. | NORFARIZAN MOHD SAID | 11.1 | 1 | 2 | 1 | 1 | 3 |
| 7. | KHAIRIAH MOHD YAZID | 0.0 | 0 | 0 | 0 | 0 | 0 |
| 8. | MOHD HAIRIE RABIR | 0.0 | 0 | 0 | 0 | 0 | 0 |
| 9. | MOHD FAIRUS ABDUL FARID | 0.0 | 0 | 0 | 0 | 0 | 0 |
| 10. | TONNY LANYAU | 0.0 | 0 | 0 | 0 | 0 | 0 |
| 11. | ZAREDAH HASHIM | 4.3 | 0 | 1 | 1 | 1 | 3 |
| 12. | HASNIYATI MD RAZI | 2.3 | 0 | 1 | 0 | 0 | 0 |
| 13. | PHONGSAKORN BAK TOM | 0.0 | 0 | 0 | 0 | 0 | 0 |

Summary

PEGAWAI

01 JULIA ABDUL KARIM

02 MUHAMMAD KHAIRUL ARIFF

03 ABI MUTTAQIN JALAL BAYAR

04 NAIM SYAUQI HAMZAH

05 MARK DENNIS USANG

06 NORFARIZAN MOHD SAAD

07 KHAIRIAH MOHD YAZID

08 MOHD HAIRIE RABIR

09 MOHD FAIRUS ABDUL FARID

10 TONNY LANYAU

11 ZAREDAH HASHIM

12 HASNIYATI MD RAZI

13 PHONGSAKORN BAK TOM

14 ZAREDAH HASHIM

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