

ANSN Annual Meeting and Regional Advisory Safety
Committee for Research Reactor in Asia Pacific (RASCAP)

31ST AUGUST-4TH SEPT 2015
SERPONG, TANGERANG SELATAN - INDONESIA

PEER REVIEW ON THE PERIODIC SAFETY REVIEW OF RSG-GAS REACTOR



Endiah Puji Hastuti
Indonesia

CONTENTS

1

Introduction

2

PSR Regulation in Indonesia

3

Strategy to Develop PSR

4

Special Documents Requirement

5

Conclusion

INTRODUCTION

- Background
- RSG GAS: first criticality July 1987, the licence will be expired by 2020
- Regarding to National act of BAPETEN chairman regulation regulation **No. 2/2015 on Safety Verification and Review of Non Power Reactor**, consequently to renewable licensing permit, RSG GAS as an operator org must be submit the PSR.
- Currently, RSG GAS have been preparing for the 1st PSR

LICENCING STATUS OF INDONESIA RESEARCH REACTOR



Kartini Reactor –
Triga-100 kW-first
Criticality 1979
Op lisence 2016
renewal of
operating permit

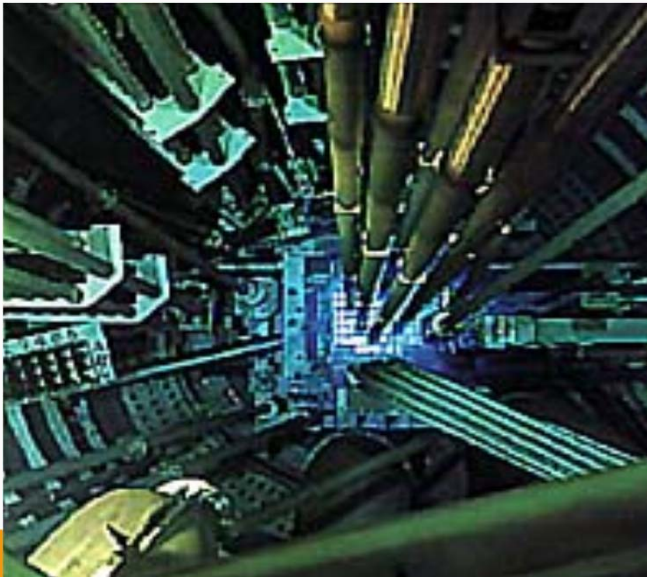


TRIGA 2000-Bandung-2
MW- first Criticality 250
KW1965-1MW 1971-2000
Op lisence 2020
rr renewal of operating
permit



RSG-GAS-30 MW
Serpong- first
Criticality July 1987;
Op lisence 2020
renewal of
operating permit

30MW MULTIPURPOSE REAKTOR-SERPONG-INDONESIA



❑ RSG-GAS is pool type research reactor and fueled by plate type of U_3Si_2-Al with 19.75 % enrichment.

❑ Maximum Power operation is 30 MW.

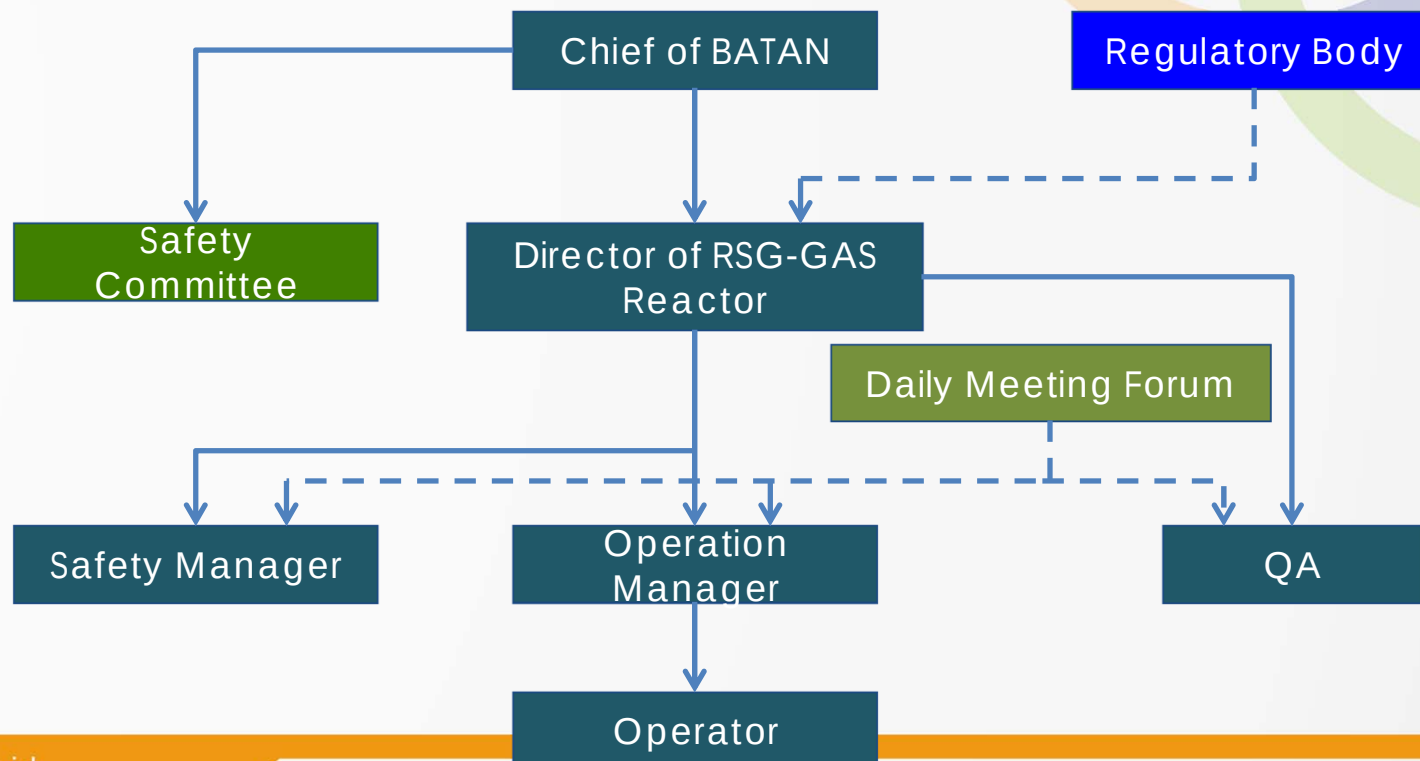
❑ It has average thermal flux about $2 \times 10^{14} \text{ n/cm}^2/\text{s}$.

MAP OF RSG GAS



SAFETY MANAGEMENT

- Is organizational activities to achieve the safe operational, utilization, maintenance, research and development of the research reactor under supporting of the establishment related parties/ Institutions such as regulatory body



APPLICATION DOCUMENTS FOR RENEWAL OF THE OPERATION PERMIT

1. **Safety analysis report;**
2. **Periodic safety review report;**
3. **Operation report; and**
4. **Aging assessment report.**

PERIODIC SAFETY REVIEW REGULATION

Article 37

- The licensee shall perform safety verification and review during, construction, commissioning, and operation stage of nuclear, installation.

Article 39

- Safety review as stipulated in Article 37 shall be performed periodically and cover review to the:
 - a. nuclear installation design;**
 - b. latest condition on structure, system, and component;**
 - c. tools qualification;**
 - d. ageing;**
 - e. safety performance and feedback on operation experience;**
 - f. safety management and nuclear preparedness program; and**
 - g. radiological impact on the environment.**

THE OBJECTIVE OF THE PSR

- to arrive at a judgement of the plant's ability and the safety culture for continued operation on the basis of a balanced view of the significant PSR results, including the safety improvements and the strengths of the plant identified in the reviews of the various safety factors.
- The impact on safety associated with the findings for all safety factors should be evaluated in its totality by means of the global assessment. This should be performed after completion of all individual reviews of safety factors.

COMPARATION BETWEEN IAEA SSG NO 25 AND BAPETEN CHAIRMAN REGULATION NO. 2/2015

Chp.	IAEA No SSG 25	Chp.	BAPETEN Chairman Regulation No 2/2015
1.	Facility design	1.	Introduction
2.	Actual condition of SSC important to safety	2.	Design of non-power (research) reactor
3.	Equipment qualification	3.	Condition of Structure, System and Components
4.	Ageing Management	4.	Equipment Qualification
5.	Utilization	5.	Ageing Management
6.	Initiating events and hazards analysis	6.	Safety performance and feedback on the Operation experience
7.	Safety factor :Deterministic Safety Analysis	7.	Safety management and Nuclear Emergency Planning and Preparedness Program
8.	Operating Experience	8.	Radiological Impact on the Enviromental
9.	Use of experience from other faciities and research findings	9.	Conclusion
10.	Organization, the management system and safety culture	10.	Recomendation and follow-up plan

STRATEGY

Pre

- Problem identification - to devlp PSR of RSG GAS
- Management system for PSR: Devpl. Team, with expertise members from inner and outer of RSG GAS, **interdisciplinary team with appropriate plant operation, design and safety expertise who participated in the review process.**

Plan

- Development of planning and personel for each chapters
- Preparing of all documents, with an assumption RSG GAS have operating the reactor as a procedure and maintenance as a manual operation, and keep all the document as living document.

Guide

- Grading approach and supervision from BAPETEN
- Review from RSG GAS Safety comittee

DOCUMENTS REQUIREMENT (1)

Chapt	Topic	Scope and Obj.	Document
1.	Introduction		
2.	Design of non-power (research) reactor	1. Comparison between original design, updated document, requirement/regulation and actual condition. 2. Evaluation of Plus and minus of the design	1. BAPETEN chairman regulation 2/2015 2. LAK 3. Blue Print 4. DIQ 5. Results evaluation report - RER 6. Investigation evaluation report-IER
3.	Condition of Structure, System and Components	1. List of SSCs actual condition regarding to fulfill the OLC 2. List of SSCs actual condition regarding to aging. 3. List the requirement changes and standard design on SSCs. 4. SSCs failure trend 5. Evaluation of Plus and minus of the design	1. BAPETEN chairman regulation 2/2015 2. Maintenance program 3. Aging program 4. SAR 5. RER 6. IER 7. Maintenance/Repairing Log book 8. Failure of SSCs Log book

DOCUMENTS REQUIREMENT(2)

Chapt	Topic	Scope and Obj.	Document
4.	Equipment Qualification	1. Comparison between original design, updated document, requirement/regulation and actual condition. 2. SSCs failure trend 3. Evaluation of plus and minus of the design	1. BAPETEN chairman regulation 2/2015 2. SAR rev number 3. Procedure number 4. RER number 5. IER number
5.	Ageing Management	1. Compation between requirement regulation, aging management program and conduction. 2. List of aging mechanism on SSCs , that not yet took into account. 3. The effektivity of existing aging mitigation 4. The SSCs that need to list into the aging program 5. Evaluation of plus and minus of the aging management	1. BAPETEN chairman regulation 2/2015 2. SAR rev number 3. Maintenance Log number 4. Procedure number 5. RER number 6. IER number 7. Aging assessment report
6.	Safety performance and feedback of Operation experience	1. List of the hazards that not yet determine on PIE 2. List of the OLC values that frequent exceed 3. List of the scram cause 4. Comparation between calculation and measurement. 5. Analysis results on worker dosage 6. Resume Safety Performance Indicator	1. BAPETEN chairman regulation 2/2015 2. SAR rev number 3. Maintenance Log number 4. Repairing Log number 5. Operation reports 6. Worker dosage record 7. Failure Log number 8. RER number 9. IER number

DOCUMENTS REQUIREMENT(3)

Chapt	Topic	Scope and Obj.	Document
7.	Safety management and Nuclear Emergency Planning and Preparedness Program	1. Safety culture Tabel Budaya Keselamatan (Batan chairman reg No. 200/2012) 2. Evaluation results on human/worker availability 3. Evaluation on education and training program. 4. Evaluation result on connection program of KN PRSG-KNS 5. Pelaksanaan Program KN	1. BAPETEN chairman regulation 2/2015 2. BATAN chairman regulation 3. SAR rev number 4. Operation report 5. RER number 6. IER number 7. Emergency exercise report
8.	Radiological Impact on Environmental	1. Monitoring analysis report on the stack monitor	1. BAPETEN chairman regulation 2/2015 2. BATAN chairman regulation 3. SAR rev number 4. Operation report 5. RER number 6. IER number 7. Emergency exercise report 8. RPL RKL KNS
9.	Conclusion		
10.	Recommendation and follow-up plan		

EXAMPLE WORKING PLAN: CHAPTER 4 EQUIPMENT QUALIFICATION

Equipment Qualification concern to:

1. Install equipment appropriate with qualification requirement
2. the adequacy of the records of equipment qualification
3. Updating procedure and maintenance of equipment qualification during lifetime of equipment operation
4. Procedure to ensure the modification and addition of important SSCs for safety not reduce the SSCs qualification

A. AEQUIPMENT QUALIFICATION REVIEW(2)

5. Maintenance program and maintenance evaluation procedure used to ensure that degradation due to ageing on qualified equipment still no signifikan.
6. Enviromental actual monitoring and identification of hotspot condition againsts to activity or high temperature , and
7. Protection of qualified equipment against to bad enviromental condition.

CHPT 4: SCHEDULE-2015

KEGIATAN/BULAN	2	3	4	5	6	7	8	9	10	11	12
Penyusunan tim PKB dan pembagian tugas	x										
Penyusunan program kerja dan penyiapan dokumen/prosedur		x									
Seleksi dan penyusunan jenis peralatan SSK terkait keselamatan			x								
Penyusunan kecukupan catatan kualifikasi peralatan				x							
Kompilasi Prosedur modifikasi dan penambahan SSK					x						
Kompilasi program perawatan dan evaluasi perawatan						x	x				
Penyusunan hasil pemantauan kondisi lingkungan aktual							x				
Identifikasi titik lokasi (hot spot) yang terkena aktivitas atau temperatur tinggi								x			
Identifikasi perlindungan peralatan terkualifikasi									x		
Menyusun kesimpulan										x	

CHPT4 :SCHEDULE-2016

KEGIATAN/BULAN	2	3	4	5	6	7	8	9	10	11	12
Evaluasi tugas PKB 2015	x										
Koordinasi program kerja PKB 2016		x									
Review hasil seleksi dan penyusunan jenis SSK terkait keselamatan			x								
Review hasil Penyusunan kecukupan catatan kualifikasi peralatan				x							
Review hasil Kompilasi Prosedur modifikasi dan penambahan SSK					x						
Review Kompilasi program perawatan						x	x				
Review hasil Penyusunan hasil pemantauan kondisi lingkungan aktual							x				
Review hasil Identifikasi titik lokasi (hot spot) yang terkena aktivitas atau temperatur tinggi; dan perlindungan peralatan terkualifikasi								x			
Penyusunan Bab IV mengenai Kualifikasi Peralatan									x	x	x

CONCLUSSION

- RSG GAS operation permit will be expired on 2020. According to renewal of the operation permit, recently RSG GAS have been preparing for the 1st PSR to meets BAPETEN chairman regulation No 2/2015. regarding to the new regulation, the renewal permit documents should be submit 3 years prior before, therefore RSG GAS have a target to complete the PSR in 2 years (2017).

THANK YOU FOR YOUR ATTENTION

