



**NIGERIAN NUCLEAR REGULATORY AUTHORITY
CHECKLIST FOR COMMISSIONING AND REGULAR INSPECTION OF NUCLEAR
RESEARCH REACTOR**

Guidance Notes for Inspector(s):

Prepare a visit agenda to review the operating programme with details contained in the application for authorization, the authorization certificate, prior programme review/inspection reports and their implementation, relevant correspondence and other relevant documentation such as dosimetry reports, visible safety risks, maintenance or any unscheduled breakdown.

- Check the following for compliance with the authorization and with the NNRA requirements.
- Monitoring equipment and accessories required should be available for use as and when required.
- Give entry briefing to the most senior management personnel

I IDENTIFYING INFORMATION

I-1 Name of the Institution:

I-2 Address of Facility:
.....
.....

I-3 Telephone/facsimile/email: Tel. #: Fax:

Email:

I-4 Authorization Number:

I-5 Name and Qualification of the Reactor Manager

Name:

Degree:

Certification:

Experience:

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I-6 Name and Qualification of any Qualified Experts retained

Name:

Degree:

Certification:

Name: Experience:

Degree:

Certification:

Experience: Name:

..... Degree:

..... Certification:

..... Experience:

.....

.....

I-7 The name and title of the Responsible Representative of the Legal Person:

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vii) Reactor operating sign	Working? On? Off?	Yes Yes Yes	No No No
viii) Concrete Shielding for solid and liquid radioactive waste in place.	Provided? Working?	Yes Yes	No No

II-4 Water Purification

a) Are routine periodic measurements of reactor water/ pool water purification system water resistivity made by the staff or qualified expert?	Yes	No
b) Feed water make up system ok?	Yes	No
c) Record independent measurements made during the inspection (reactor water)	Yes	No
d) Record independent measurements made during the inspection (pool water).....	Yes	No
e) Are the inspector's independent measurements in agreement with the organization routine measurements?	Yes	No
f) Document any significant differences and any agreed upon plan to resolve the different results:		

II-5 Warning Systems

a) Exposure signals and posted explanation (e.g. audible or visible Alarms, illuminated signs)	Provided? Legible In local language?	Yes Yes Yes	No No No
b) Warning notices	Provided? Local language?	Yes Yes	No No
c) Security monitoring systems and the reactor associated alarms.	Provided? Up to date?	Yes Yes	No No

II-6 Safety Operations Management

a) Is management knowledgeable of the certificate of authorization and its restrictions and requirements?	Yes	No	
b) Does management provide adequate staffing levels?	Yes	No	
c) Has management provided the Reactor manager authority to stop unsafe operations?	Yes	No	
d) Does management provide adequate resources for personnel training (time and money)?	Yes	No	
e) Does management provide for periodic programme reviews and recommendations?	Scheduled? Performed?	Yes Yes	No No
i) Date of the last programme review:			
ii) Status of recommendations:			
.....			
.....			
.....			

III VERIFICATION OF WORKER PROTECTION

III-1 Classification of Areas

a) Are controlled areas demarcated?		Yes	No
b) Are approved signs at access points?	Provided?	Yes	No
	Legible?	Yes	No
	local language?	Yes	No
c) Is reactor hall at a physically defined location?		Yes	No
i) locked/secured location with key control?		Yes	No
ii) radiation warning notices?	Provided?	Yes	No
	Legible?	Yes	No
	local language?	Yes	No
iii) proper shielding (e.g., individual containers, enclosure)?		Yes	No
d) Are supervised areas demarcated?		Yes	No
e) Are approved signs at access points?	Provided?	Yes	No
	Legible?	Yes	No
	local language?	Yes	No

III-2 Local rules and Supervision

a) Are rules established in writing?		Yes	No
b) Do rules include investigation levels and authorized levels and the procedure to be followed when a level is exceeded?		Yes	No
c) Are workers instructed in the implementing procedures?		Yes	No
d) Is operation of the reactor done in accordance with prescribed operating procedures and conditions?		Yes	No
e) Do workers have adequate supervision to ensure rules, procedures, protective measures and safety provisions are followed?		Yes	No
f) Specifically, are operating and working procedures for:			
i) setting up controlled areas; including barriers, surveillance.	Provided?	Yes	No
	Adequate?	Yes	No
	Followed?	Yes	No
ii) set-up of exposures (radiation source output beam direction, use of collimators, beam height):	Provided?	Yes	No
	Adequate?	Yes	No
	Followed?	Yes	No
iii) use of personal dosimetry and use of protective equipment such as alarming rate dosimeter:	Provided?	Yes	No
	Adequate?	Yes	No
	Followed?	Yes	No
iv) performing repairs and maintenance of safety systems:	Provided?	Yes	No
	Adequate?	Yes	No
	Followed?	Yes	No
v) making surveys	Provided?	Yes	No
	Adequate?	Yes	No
	Followed?	Yes	No
vi) responding to alarm:	Provided?	Yes	No
	Adequate?	Yes	No
	Followed?	Yes	No

IV Monitoring

a) Does the authorized organization provide personal dosimeter?	Yes	No
b) Are the dosimeters:		
i) Worn properly?	Yes	No
ii) Calibrated	Yes	No
iii) Exchanged at required frequency?	Yes	No
c) Are personnel exposures within limits?	Yes	No
d) Area and portable survey instruments		
i) Appropriate?	Yes	No
ii) Calibrated?	Yes	No
iii) Operational?	Yes	No
iv) Operational check performed before use?	Yes	No
v) Do the authorized organization's surveys indicate that the radiation room shielding is adequate and the dose rates around the room meet authorized radiation levels?	Yes	No
vi) Does the authorized organization make periodic tests for leakage?	Yes	No
f) Is the instrumentation:		
i) Appropriate?	Yes	No
ii) Calibrated?	Yes	No
iii) Operational?	Yes	No
Record independent measurements made during the inspection:		
.....		
Type/Model No. of Survey Meter:		
Date last calibrated:		
Do the inspector's independent surveys agree with the survey results of the authorized organization?	Yes	No
Document any significant differences and any agreed upon plan to resolve the different results:		
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.....		

V VERIFICATION OF PUBLIC PROTECTION

V-1 Control of Visitors

a) Are visitors accompanied in controlled area?	Yes	No
b) Is adequate information provided to visitors entering controlled areas?	Yes	No
c) Are there adequate control over entries into supervised areas and appropriate postings?	Yes	No

V-3 Disposal of Equipment

a) Have provisions been made to transfer radioactive waste to an appropriate registrant or licensee or to an authorized waste disposal facility at the end of use?	Yes	No
b) Does the authorized organization have a plan for timely transfer or disposal of the equipment?	Yes	No
c) Have provisions been made for decontamination in the facility.	Yes	No

V-4 Monitoring of Public Exposure

a) Are routine periodic measurements of exposure rates in public areas adjacent to controlled and supervised areas made by the staff or qualified expert?	Yes	No
b) Do surveys shows that the dose rates outside the controlled and supervised areas meet authorized radiation levels?	Yes	No
c) Record independent measurements made during the inspection.	Yes	No
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Type/Model No. of Survey Meter:		
Date last calibrated:		
Are the inspector's independent measurements in agreement with the organization routine measurements?	Yes	No
Document any significant differences and any agreed upon plan to resolve the different results:		

VI EMERGENCY PREPAREDNESS

VI-1 Emergency Plan

a) Is there a written plan?	Yes	No
b) Is the plan periodically reviewed and updated?	Yes	No
c) Does the plan take into account lessons learned from operating experience and accidents at similar facilities?	Yes	No

VI-2 Training and Exercises

a) Have workers involved in implementing the plan received training?	Yes	No
b) Have provisions been made of the plan to be rehearsed at suitable intervals in conjunction with any designated emergency response authorities?	Yes	No
c) Date of the last rehearsal:		

VII Verification of Records

i) Is a copy of authorization certificate available for inspection?	Yes	No
ii) Are personal dosimetry records being kept?	Yes	No
iii) Dosimetry		
a) current dose and analyzed?	Yes	No
b) collect dose and analyzed?	Yes	No
iv) Area surveys records being kept?	Yes	No
v) Contamination survey records being kept?	Yes	No
vi) Are operating log book records kept?	Yes	No
vii) Are irradiation log book records kept?	Yes	No
viii) Are instrument tests records kept?	Yes	No
ix) Are control console flux records kept?	Yes	No
x) Are audits and reviews of radiation safety programmes records kept?	Yes	No
xi) Are incident and accident investigation reports kept?	Yes	No
xii) Are maintenance and repair work records kept?	Yes	No
a) pool water average activities	Yes	No
b) reactor container water average activities	Yes	No
c) pool water make up conductivity (pH between 5.5 and 6.5)?	Yes	No
d) head space gas purge exhaust time.	Yes	No
xiii) Are facility modifications records kept?	Yes	No
xiv) Are training provided	Yes	No
a) initial	Yes	No
b) fresher	Yes	No
xv) Are evidence of health surveillance records kept?	Yes	No
xvi) Are waste disposals programme and records kept?	Yes	No
xvi) Are visitors logs kept?	Yes	No

VIII COMMENTS AND RECOMMENDATIONS

Name of Radiation Safety Officer:..... Signature:.....

Name of Inspector:

Signature: Date: