#### NUCLEAR FUEL CONTRACT APPENDIX K

Page 5/7

#### **K.3 DOCUMENTATION**

The following NFC Deliverables given in Appendix E are to be provided under the physics start-up program under NFC. NFC part and EPC part will cooperate together as to create one integral output



The above documentation shall satisfy requirements applicable for physics start-up testing presented in the Construction and Commissioning Document, Section 3.6.

Basically, EPC supplier will be responsible for all test procedures during commissioning including Physical Start-up Test in Active Testing. The test manual and test program along with the related document will be developed under the management of EPC supplier. The equipment for physics test will be supplied according to EPC Contract. The actual predicted data for physics test will be provided by NFC for each cycle. The Supplier is responsible to assure consistency between the relevant deliveries of EPC Contract and NFC.





Dukovany
5&6

NUCLEAR FUEL CONTRACT
APPENDIX K

Page
6/7

However, the requirements and the acceptance criteria along with related background knowledge including training for test operation will be provided based on Appendix J. The cycle specific input for physics test will be supplied by NFC supplier. It is also responsibility of NFC supplier to provide Technical Assistance during the physics test.





Dukovany
5&6

NUCLEAR FUEL CONTRACT
APPENDIX K
Page
7/7

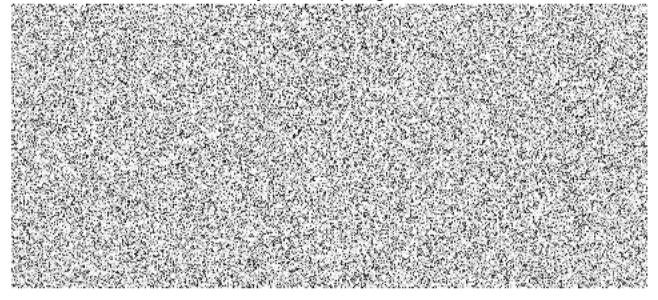
# **K.4 SCHEDULING**

Physics start-up program will be a part of the general commissioning program. The testing procedures and related documents will be developed by the Supplier and will be subject to the Owner's review and approval.



The actual physics start-up data for each Cycle will be provided when the Core Design is completed with the as-built manufacturing data. The documents provided for physics start-up test are listed in the below Table K.4.1 and will be provided in accordance with Appendix E.

Table K.4.1 List of Document for Physics Start-up Program







# NUCLEAR FUEL CONTRACT APPENDIX L

Page 1/14

# NUCLEAR FUEL CONTRACT APPENDIX L

**DOCUMENT NAME:** 

NUCLEAR FUEL CONTRACT APPENDIX L





#### NUCLEAR FUEL CONTRACT APPENDIX L

Page 2/14

# **L-NUCLEAR MATERIAL**

Owner is responsible for the supply of Nuclear Material for fabrication of the First Core Supply Batches and Reload Supply Batches as specified in Chapter 3 of the NFC. This Appendix L specifies in more detail the terms and conditions for calculation of quantities of Nuclear Material to be delivered, delivery of Nuclear Material to Supplier by an account-to-account transfer and by a physical delivery and an evaluation of balance in the Material Account.

# L.1 DETERMINATION OF FEED AND SWU NEEDS

# L.1.1 CALCULATION FORMULA

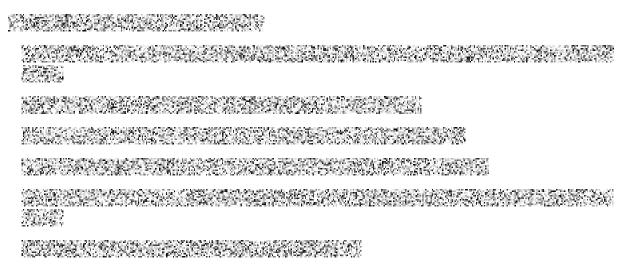






#### NUCLEAR FUEL CONTRACT APPENDIX I

Page 3/14



# L.1.2 CALCULATION TAILS ASSAY





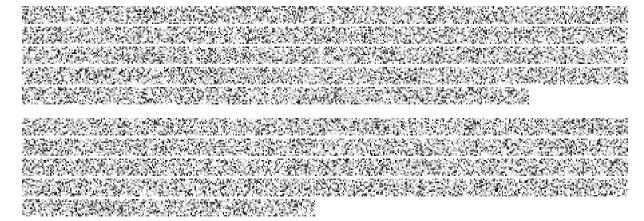


#### NUCLEAR FUEL CONTRACT APPENDIX I

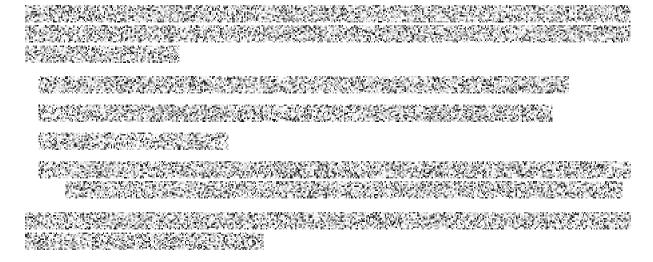
Page 4/14

# L.2 DELIVERY OF NUCLEAR MATERIAL BY ACCOUNT-TO-ACCOUNT TRANSFER (Mode 1)

# L.2.1 DETERMINATION OF ASSAYS AND QUANTITIES TO BE DELIVERED



#### L.2.2 NOTICES AND INFORMATION EXCHANGE



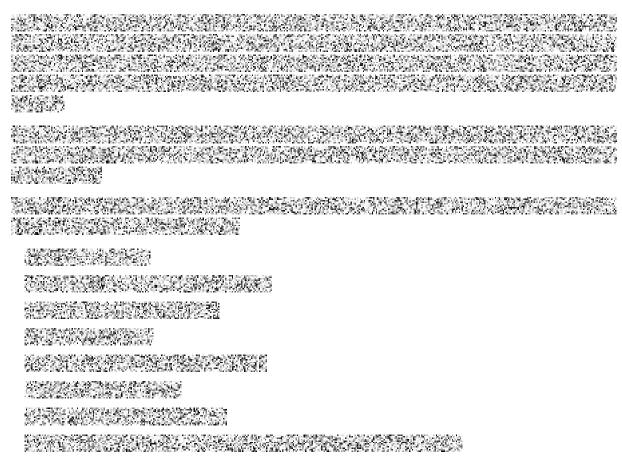


#### NUCLEAR FUEL CONTRACT APPENDIX I

Page 5/14

# L.3 DELIVERY OF NUCLEAR MATERIAL BY PHYSICAL DELIVERY (Mode 2)

# L.3.1 DETERMINATION OF ASSAYS AND QUANTITIES TO BE DELIVERED



# L.3.2 DELIVERY CONDITIONS

# L.3.2.1 EUP Transport cylinders and packaging sets







Dukovany
5&6

# NUCLEAR FUEL CONTRACT APPENDIX L

Page 6/14

L.3.2.2 EUP samples and its packaging and delivery





#### NUCLEAR FUEL CONTRACT APPENDIX I

Page 7/14

# L.3.2.3 Nuclear Material origin and other limitations

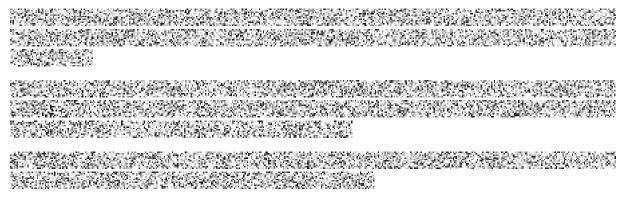


# L.3.2.4 Import procedure and co-operation of the Parties



# L.3.2.5 Not used

# L.3.2.6 Nuclear Material handover procedure

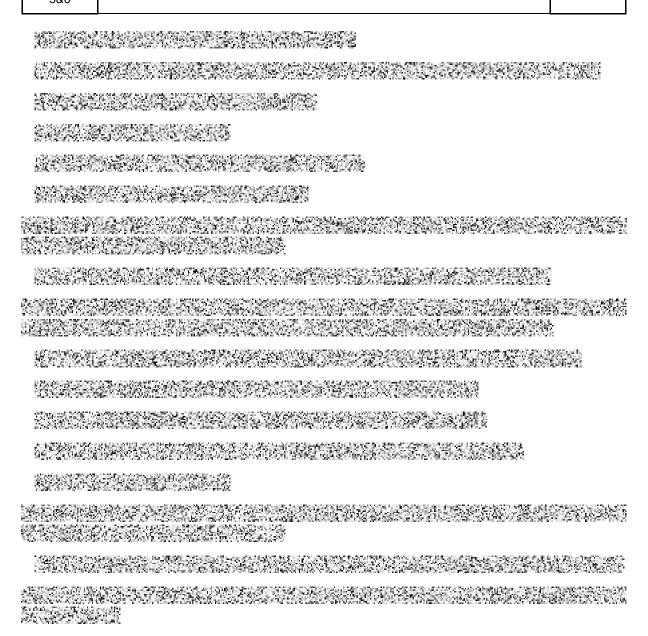






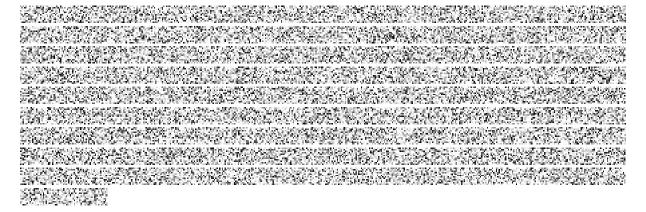
#### NUCLEAR FUEL CONTRACT APPENDIX I

Page 8/14



# L.3.3 WEIGHING AND ACCEPTANCE PROCEDURE

# L.3.3.1 Nuclear Material acceptance procedure







Dukovany	NUCLEAR FUEL CONTRACT
5&6	APPENDIX L

Page 9/14

					20	N.	fg.				200		XX,	34				13		B	100											25	1	
						97.07 1763								2-30 100 100		GYA GYA	579 54				\$13 \$13					334				概	额		AB)	Sec.
Œ.			15.00 15.00	<b>\$49</b>	1378 1378	48			er. He	2040 135								10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.000 10.0000 10.000					缓		(57) (1)					18			artis 有物。	
				įψ.									67 1428	激			96 96						16							200				松
		1378 1377											 						 															1967 1969
					A.	N.A.				2 3		3	が								44	20		K				14	3				3	被
		1965 1967 1967																																
1756 1750	证的 化包							713	游	2.3					200 200							V.P.	2	10,	識	ing.	100		烈	数				器
E.		STATE	E S	34					M.	模										12. A	No.		97	ten.		10		形		883		<b>W</b>		
		(Sept.)											 						 						M		差						2000 2000	開発
		33	1	特別				193							製				Ġ.			77												

# L.3.3.2 Resolution of disputes concerning Nuclear Material acceptance





# NUCLEAR FUEL CONTRACT APPENDIX L

Page 10/14

PERCENTING TO A STATE OF THE PROPERTY OF THE P THE RESERVE OF THE PROPERTY OF
BREAD MAN AND AND AND AND AND AND AND AND AND A
HICKALANTEN ANTEN ANTEN EN ALLE ANTEN EN E





# NUCLEAR FUEL CONTRACT APPENDIX L

Page 11/14

	Š
	報
	K.
	É
######################################	GK.
	画を
	退地
AND CONTRACTOR OF THE SECOND PROPERTY OF THE	激用
BARGE MART I DE MERKER TREI BERT I ET EN ET DE MET EN FRANT DE SENERE EN LE SE EN EN BARGE BERT BERT BERT BER BERT BERT BERT BERT BERT BERT BERT BERT	59
	弱
	ig.
	源,
	数の
	9.70
	图
	版
	10
是是是"这个人的,我们就是这种的,我们是不是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人 一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就是一个人的,我们就	15 13
	1990
等。如此,他们就是有一种,我们就是是不是不是一种的。""我们就是不是一个人,我们是一个人,我们是一个人的,他们就是一个人的,他们就是一个人的,我们就是一个人的	
	100
	ij
	總
。 我的最低的是另外是1987年代的人为1987年的人的人们的,他是1986年的的人们的1987年的时间的人们的1988年生活的人们的1988年上海的1987年代,这种1987年的人们的1987年代的1987年代的1987年	208
NAMES OF THE PROPERTY OF THE P THE PROPERTY OF THE PROPERTY OF	90 93
ENTER AND CONTRACTOR DE PRÉSENTATION DE LA PROPERTIE DE LA CONTRACTOR DE L	路底
	经区
PER LANGE TO BE THE PROPERTY OF THE PROPERTY O	製物
等,我们就是一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个	经规则
AND THE PROPERTY OF THE PROPER	





# NUCLEAR FUEL CONTRACT APPENDIX L

Page 12/14

<b>的情况是</b>				
	And the second second		效	
HARRISON CONTRACT		The second second		





# NUCLEAR FUEL CONTRACT APPENDIX L

Page 13/14

# L.4 NUCLEAR MATERIAL INVENTORY IN THE FABRICATION PLANT

PLAN	LIMITATIONS T	OIT IITVEITIO				TABINOATION
L.4.2	TRANSFER O	F NUCLEAR MA	ATERIAL IN M	NATERIAL AC	COUNT TO A	THIRD PARTY
		MATERIAL AC	CCOUNT AFT	TER THE TER	RMINATION O	R EXPIRATION
OF TH	IE NFC					
OF TH	IE NFC					
OF TH	IE NFC					



#### NUCLEAR FUEL CONTRACT APPENDIX L

Page 14/14







# NUCLEAR FUEL CONTRACT APPENDIX M

Page 1/28

# NUCLEAR FUEL CONTRACT APPENDIX M

**DOCUMENT NAME:** 

NUCLEAR FUEL CONTRACT
APPENDIX M





#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 2/28

# M - FUEL ASSEMBLY AND CORE COMPONENTS FABRICATION INFORMATION

After each fabrication campaign of Fuel Assemblies and Core Components, Supplier shall provide to Owner the information listed in this Appendix M.

# M.1 GENERAL INFORMATION ABOUT FIRST CORE SUPPLY BATCH OR RELOAD SUPPLY BATCH







#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 3/28

# M.2 GENERAL INFORMATION AND TECHNICAL DATA OF FUEL ASSEMBLY



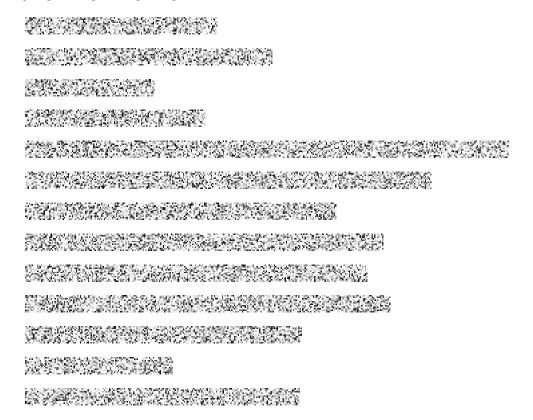




#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 4/28

# **M.3 FUEL ROD TECHNICAL DATA**







#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 5/28

# M.4 GENERAL INFORMATION AND TECHNICAL DATA OF CORE COMPONENTS

The information related to Core Components is passed over together with each Core Components delivery according to the following list

General information and technical data of Core Component



Prior to the first Fuel Assembly and Core Component delivery under NFC, Parties shall develop a detailed definition of the information structure / format.





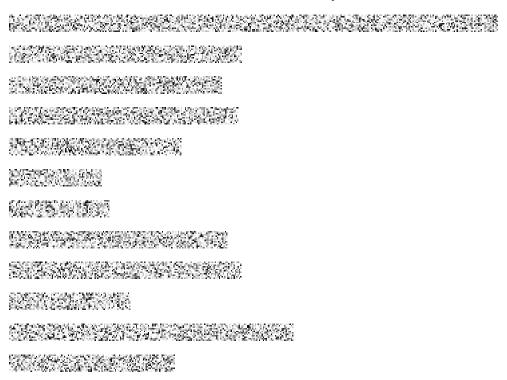
#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 6/28

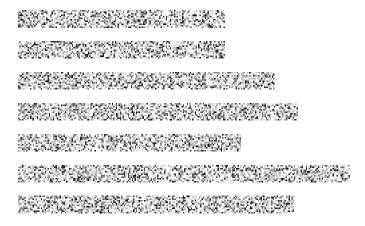
# M.5 ADDITIONAL INFORMATION ON QUALITY MANAGEMENT, MECHANICAL, PHYSICAL AND CHEMICAL PROPERTIES OF FUEL ASSEMBLY AND CORE COMPONENT PARTS

The list of other quality management related information, mechanical, physical, and chemical properties of individual parts of Fuel Assemblies and Core Components is provided in this Part.

General information and technical data of Fuel Assembly



Information on parts and components of Fuel Assembly



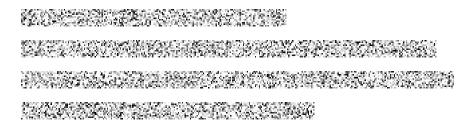




Dukovany
5&6

#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 7/28



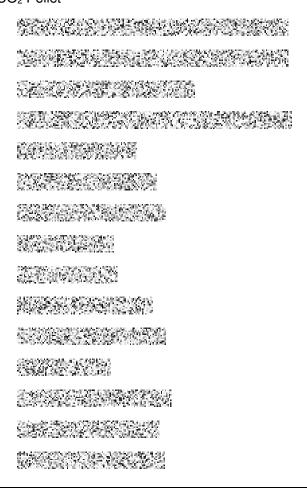
Information on mechanical, physical, and chemical properties of Fuel Assembly parts.

# M.5.1 FUEL ASSEMBLY

# UO<sub>2</sub> Powder

# Pellet

# UO<sub>2</sub> Pellet







# NUCLEAR FUEL CONTRACT APPENDIX M

Page 8/28

Mark Carries
CONCRETE STATES
March Carlos
Miles Aug. Part 1985 Part 198
All Market Turk. Control Turk. Control Turk.
数数数数 数数数数





#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 9/28



PARTELLING POTHUS PROJECTION OF

**建设建设的工程的数据** 

Mary Works

TO SEE THE PROPERTY OF THE PARTY OF THE PART

PARTY DESIGNATION OF THE PARTY OF THE PARTY

PROPERTY OF THE PROPERTY OF TH

ACCUSED AND ACCUSED

CONTRACTOR SAME AND A PARK IS MEN SAME AND A DESCRIPTION OF THE PARK IS

STATE OF THE STATE

TO THE TANK OF THE PARTY OF THE

**第43年第44年** 

The state of the s

1882-2001 1882-2001

a sufficiency From Line 2

SNIS

**经常企业**的





Dukovany
5&6

NUCLEAR FUEL CONTRACT
APPENDIX M

Page
10/28



# Fuel Rod & Gd Rod Assembly







Dukovany
5&6

#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 11/28

# **Bottom End Plug**

经不是

S. Constanting of the

# Top End Plug

CARL STATE

**发现的发现在是30%** 

能量是为的特殊的

# Fuel Rod Spring

多数因为以及

The state of the s

# Fuel Tube

HERE ELEVATION SERVED

的新疆。在古艺术的共和国的特别

ALCOHOLD STATE

五元的基础。1000年3月,2000年 1000年3月,1000年3月2日

**经证明的**对外的数据,就是任何





# NUCLEAR FUEL CONTRACT APPENDIX M

Page 12/28





#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 13/28



**国际** 

W. 1994

WEST CONTRACTOR OF THE

# Fuel Rod & Gd Rod Assembly



AND THE SECOND S

2.10mm (1.50mm) (1.5

Process of the second s

A CONTROL OF BUILDING AND AN AND AN AND AN AND AN AND AN ANALYSIS OF BUILDING AND ANALYSIS OF BUILDING A

THE PARTY OF THE PROPERTY OF THE PARTY OF TH

A STATE OF THE STA

344

# Instrument Tube





**国际政策的** 





# NUCLEAR FUEL CONTRACT APPENDIX M

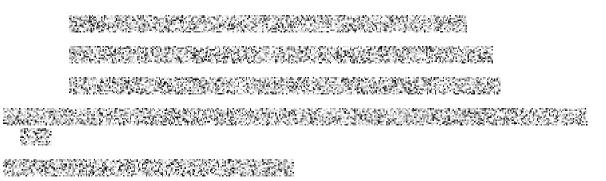
Page 14/28

公司的"不是有关"。 第1章 (1987年) (1987年) (1987年)
The Property of the Control of the C
But despressed and the second of the second
等。 (等)是一个企画
A STANTOL CONTRACTOR OF THE SAME OF THE SA



#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 15/28



# **Guide Thimble Assembly**

#### Guide Thimble Tube

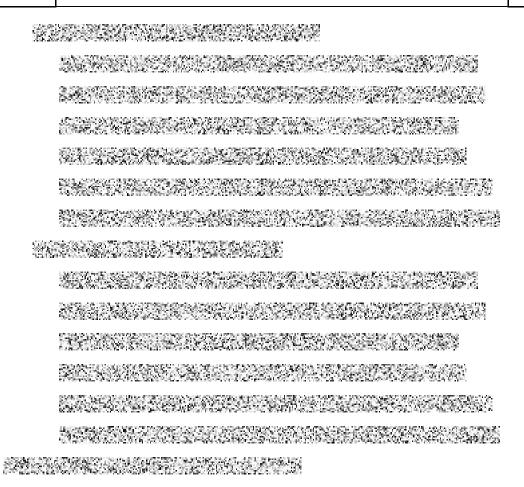






#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 16/28



# Guide Thimble End Plug

3,600,000

经的国际的现象

DAY FREDER

NEWSON PRODUCTS

省的13次联系的主管研究的

# Flange

60.000.000.000 80.000.000.000.000

是是在特殊

的常规定

Property of the control of the contr

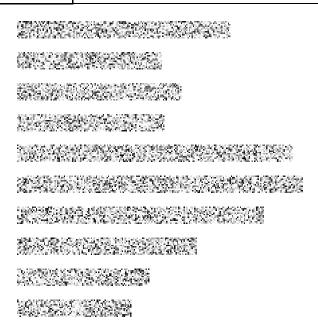
Guide Thimble Assembly





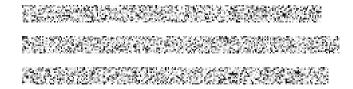
#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 17/28



# Top Nozzle Assembly

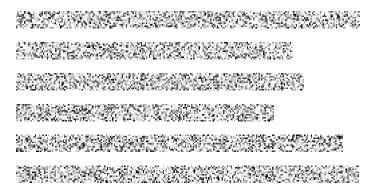
# Top Nozzle Assembly



# Top Nozzle Adapter Plate



# Top Nozzle Holddown Plate







#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 18/28

# Outer Guide Post



# Holddown Spring



# Instrument Housing



#### Raw Material



# **Bottom Nozzle Assembly**

# **Bottom Nozzle Assembly**



# Skirt & Leg Casting







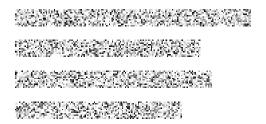
#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 19/28

#### Instrument Guide

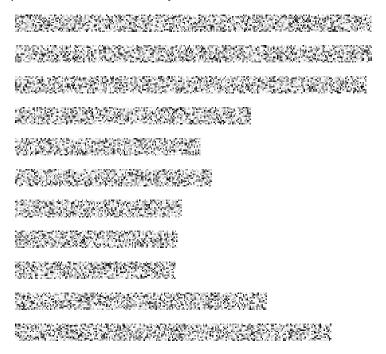


# Raw Material



# **Grid Assembly**

# Top & Bottom Grid Assembly



# Mid & IFM grid assembly







#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 20/28

#### Weld joint specimen

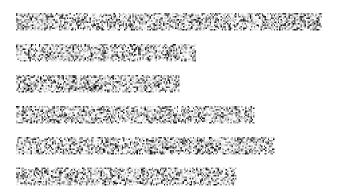


#### Skeleton assembly

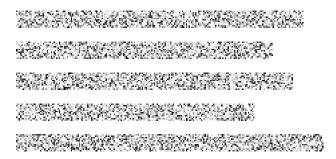
#### Thimble screw



#### Mid & IFM grid sleeve



#### Inconel grid sleeve



#### Bottom grid insert







#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 21/28

#### Dashpot tube assembly



#### Inner extension & top screw



#### Skeleton assembly



#### **Fuel Assembly**

#### **Fuel Assembly**



#### Fuel Assembly uranium weight table



#### Fuel Assembly quality traceability table







#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 22/28

#### M.5.2 CONTROL ELEMENT ASSEMBLY

#### Tube



#### SECTION SOLS



#### 



#### 

#### 

#### A MARKET AND A

#### NAME OF THE PARTY OF THE PARTY

#### 

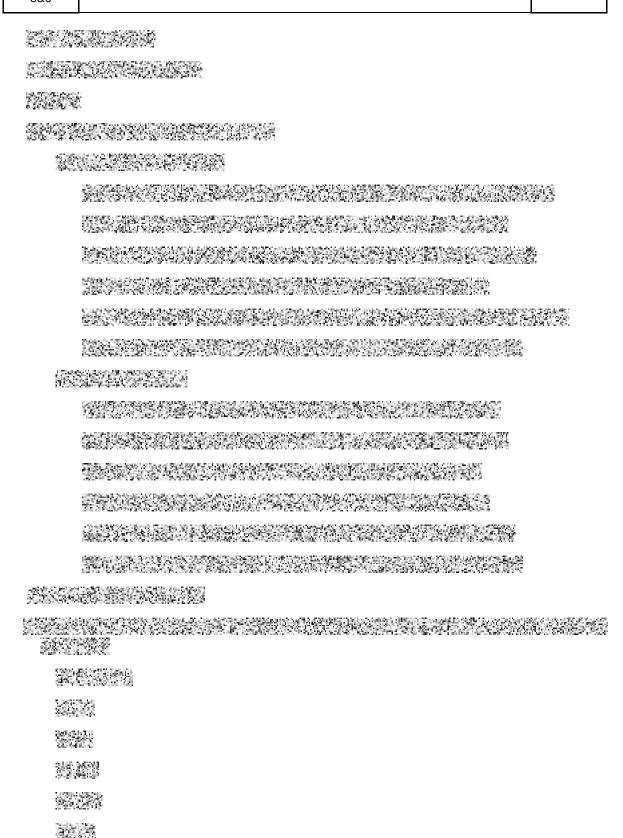






#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 23/28





国教授

學學學



#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 24/28

经 经

が表現ない。 Manager

PARTY DAY

#### **CRTA**



SECTION SECTIO



以是1962年2月2日 1962年2月1日 196





#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 25/28



#### M.5.3 NEUTRON SOURCE ASSEMBLY

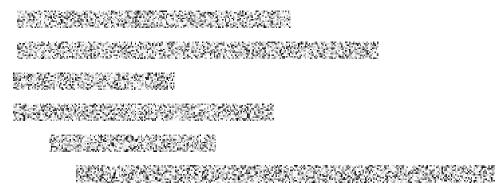
Dummy assembly



Secondary Source



End cap

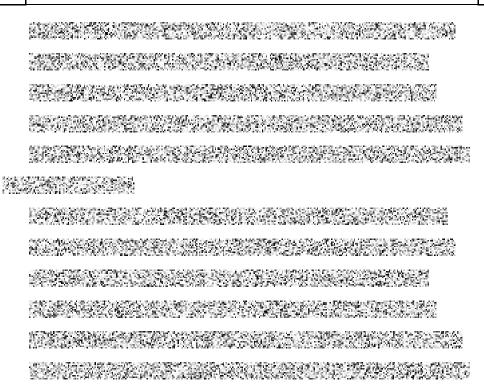




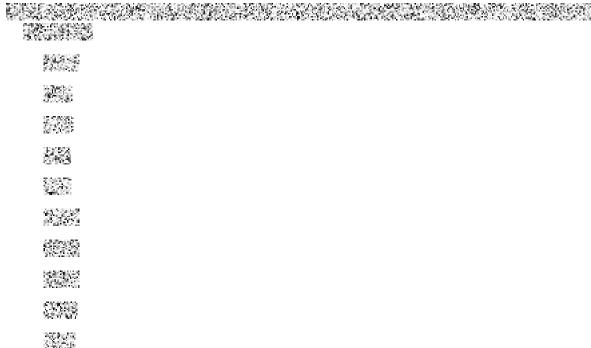


#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 26/28









2,542,23%





#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 27/28



17.8

#### **Pellet**



THE STATE OF STATE OF

ACTUAL CONTRACTORS OF A STATE OF

GENERAL TEACHERS

CONTRACTOR OF THE PARTY OF THE



TO AND THE STATE OF THE STATE O





#### NUCLEAR FUEL CONTRACT APPENDIX M

Page 28/28









#### NUCLEAR FUEL CONTRACT APPENDIX N

Page 1/12

## NUCLEAR FUEL CONTRACT APPENDIX N

**DOCUMENT NAME:** 

NUCLEAR FUEL CONTRACT
APPENDIX N





#### NUCLEAR FUEL CONTRACT APPENDIX N

Page 2/12

## N - DELIVERY DOCUMENTATION, TRANSPORT PACKAGES LABELLING, FORMS OF ACCEPTANCE/REJECTION NOTICES, ORDERS AND OTHER DOCUMENTS

### N.1 FIRST CORE SUPPLY BATCH OR RELOAD SUPPLY BATCH TRANSPORT DOCUMENTATION

In accordance with Article 5.1.6 of the NFC, the Supplier shall submit to the Owner the following documentation relating to the delivery of Fuel Assemblies and Core Components (if applicable):





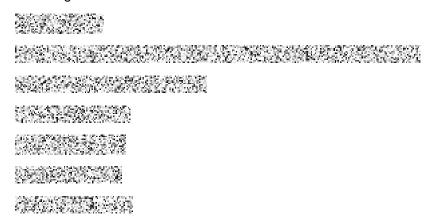


#### NUCLEAR FUEL CONTRACT APPENDIX N

Page 3/12

#### N.2 MARKING - LABELLING OF TRANSPORT PACKAGES FOR NUCLEAR FUEL

In accordance with Article 5.1.5 of the NFC, the Supplier shall ensure that the Transport Packages for Nuclear Fuel and Core Components shall have externally posted on the Transport Packages the following information:







#### NUCLEAR FUEL CONTRACT APPENDIX N

Page 4/12

### N.3 FORMS OF HANDOVER PROTOCOLS, ACCEPTANCE/REJECTION NOTICES AND OTHER DOCUMENTS

Forms of handover protocols, notices of acceptance / rejection and of other documents are provided in Figures below.





#### NUCLEAR FUEL CONTRACT APPENDIX N

Page 5/12

#### Form of New Fuel Assembly Inspection Record Sheet

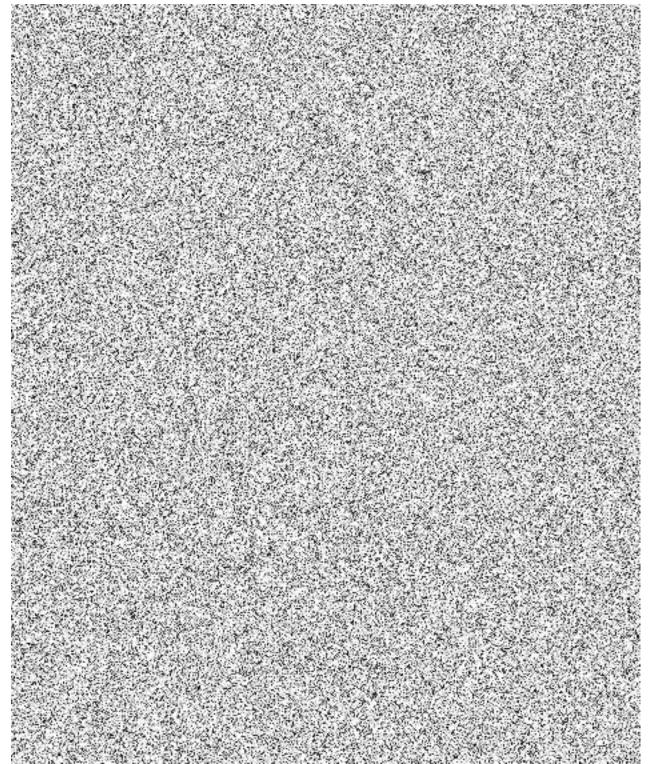


Figure N.3.1 Form of New Fuel Assembly Inspection Record





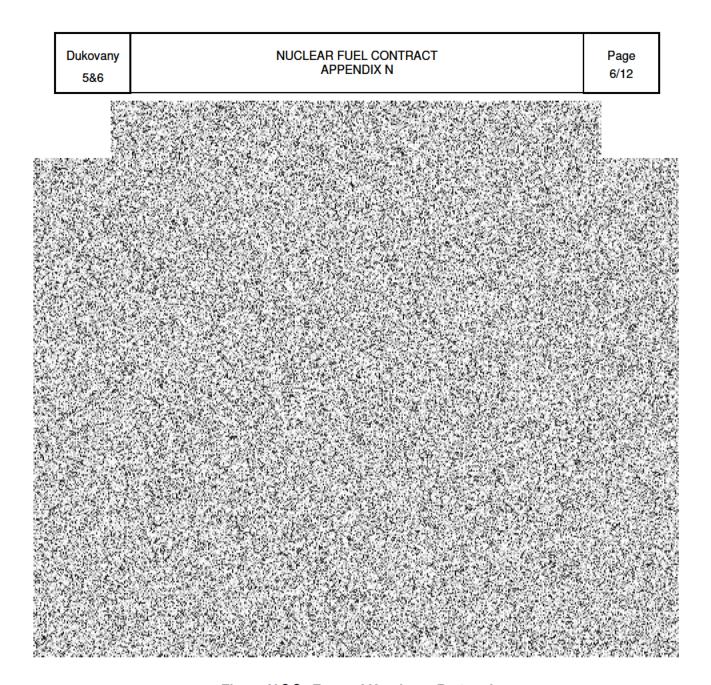


Figure N.3.2 Form of Handover Protocol



	Dukovany 5&6	NUCLEAR FUEL CONTRACT APPENDIX N	Page 7/12	
A. 4. C.				
はにはなった			(4-4) (5-4) (4-4)	
10年 200円				
CONTROL OF				
2			<b>建筑市场建设</b>	

Figure N.3.3 Form of notice of Acceptance/rejection



をはいから、 できるでは、 はないというとは、 はいのでき



#### NUCLEAR FUEL CONTRACT APPENDIX N

Page 8/12

		<b>"</b> "的是其效抗學的		
Charles and supplied the said	100	A STATE OF THE STA	71 A 27 C 75 F	
				<b>在</b> 我们的一个
				连接的特色
and the second second second		1000 St. 1000		2000年1月
			7.6	<b>美国教育</b>
2 2 W. 11 W. 13 S. 15 VO. E.				and the same of the
Section 2 Control of the section of	2.5		The second	
		ega a tradition	5 2 3	
<b>"我们就是我们的事,"</b>	<b>"特别"的</b>			
在4000年代表出了2000年代	34.11.02.45.14.74			
A BANK A MARKATAN AND AND			STATE OF THE STAT	
	1.574	SHIP CONTRACT	W. 19 19 19 19 19 19 19 19 19 19 19 19 19	
			et a least	
				r St.
		<b>建工程的</b> 工程的		
The state of the s	A STATE OF THE SAME			
		<b>利用"企业"。</b>		
1. 学业(1.60° 1.50° 1.50°)				
			A STATE AND A	756 057
			State of the same	12.2
				28 20 30 50
3 14 A 4 B 4 4 B 1 B 1 B	A 3 1 3 4 5 7	A PARTY OF THE PARTY OF		
STATE OF THE MENT			3.1.200	
	<b>公司</b>			
第1900年3月07日 (1900年1月)			Mary Mary	
and the second of				<b>企业</b>
	A CONTRACTOR OF THE PARTY OF TH			
Control of the second				
<b>建设在基础的</b>	The state of the state of			
<b>第二次,是一种特别的人类的</b>			<b>非型类的</b>	
A Part of the second	Contract Contract			
Service Carlo				
				11.0002.000
		<b>为是一种工程的</b>		
Control of the Contro	Mark State (1814)	Carlo San	表现的基本的 A. A. A. A. C.	
				10人人们是"工"的
			PROPERTY.	
			<b>可以为一种。</b>	7
		<b>美国企业企业</b>		





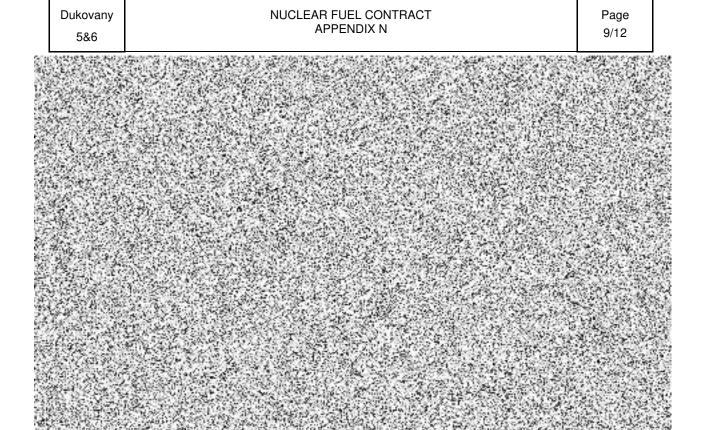


Figure N.3.4 Form of Equipment Repair Checklist





Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX N	10/12

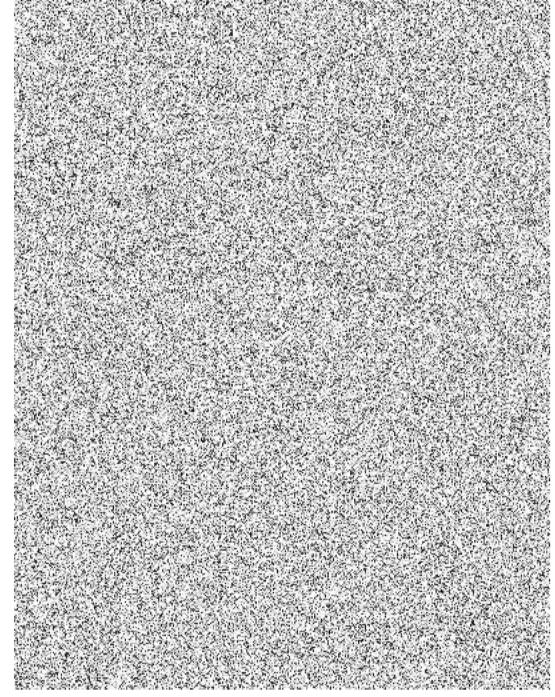


Figure N.3.5 Form of Fuel Repair Sheet



Dukovany
5&6

NUCLEAR FUEL CONTRACT
APPENDIX N

Page
11/12

#### N.4 ORDER

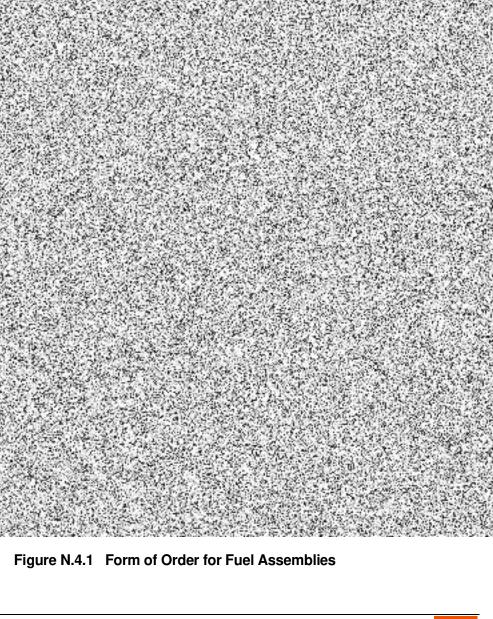
For each Reload Supply Batch, the "Order" according to Section 7.2 of the NFC shall include at minimum the quantity, type, nomenclature and price of individual Fuel Assemblies, SDD, terms of delivery, contract number and Parties signatures (or only signature of the Owner if issued unilaterally). The "Order" may be also used for custom purposes.

Form of "Order" for a Reload Supply Batch is provided in Figure N.4.1.





Dukovany 5&6 NUCLEAR FUEL CONTRACT Page 12/12







#### NUCLEAR FUEL CONTRACT APPENDIX O

Page 1/9

# NUCLEAR FUEL CONTRACT APPENDIX O

**DOCUMENT NAME:** 

NUCLEAR FUEL CONTRACT APPENDIX O





#### NUCLEAR FUEL CONTRACT APPENDIX O

Page 2/9

### O - POST IRRADIATION INSPECTION PROGRAM AND REPAIR SERVICES

0.1	TESTING OF FUEL REPAIR AND INSPECTION EQUIPMENT (FRIE), AND RELATEI INSPECTION AND REPAIR METHODS AND MEASUREMENTS	D
		がの対象を
	LIST OF PREDICTED / CALCULATED PARAMETERS OF FUEL ASSEMBLY ANI	D.
0.2	CORE COMPONENT CHARACTERISTICS BASED ON PRECHARACTERIZED FUEL	
		国際なる。
0.3	DATA ACQUISITION DURING OPERATION AND OUTAGES	
		の国際を発
0.4	REPAIRS	
		が と に に に に に に に に に に に に に
		<b>新足型 第四回</b>
	are ne en	は関係





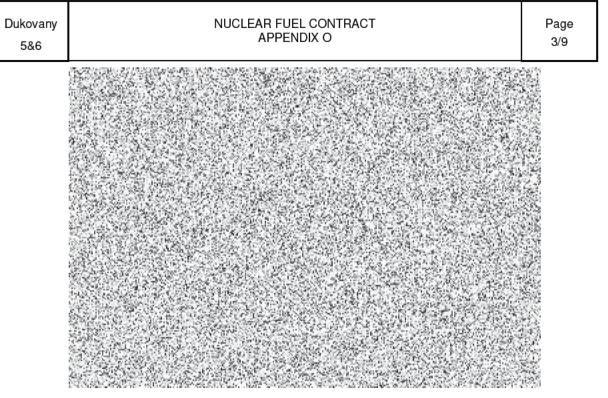


Figure O.1 Overview of repair Fuel

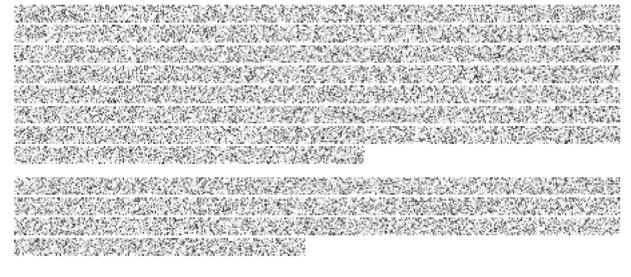
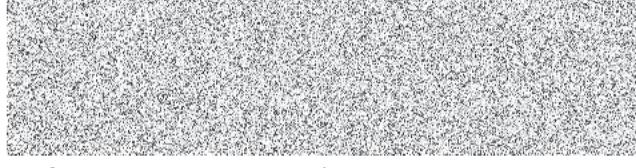


Table O 1 Renair service



The Supplier shall provide repair services as defined in Article 2.2.3.2. The repair services shall consist of damage detection, repair and root-cause evaluation.

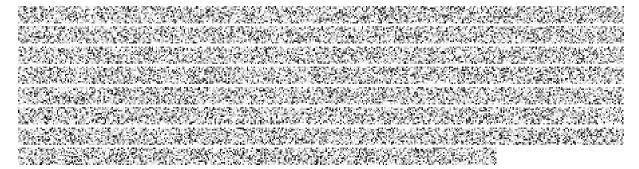




#### NUCLEAR FUEL CONTRACT APPENDIX O

Page 4/9

#### a) leaking Fuel:



The leaking fuel rod identification, failed fuel rod replacement and leak cause determination scope shall consist of the following activities:







Dukovany NUCLEAR FUEL CONTRACT Page 5/9

b) other damages
O.5 POST IRRADIATION INSPECTION PROGRAM (PIIP)
O.5.1 PIIP REQUIRED BY THE AUTHORITY AND THE OWNER
O.5.1.1 Inspection Target Fuel Assembly
Table O.2 Inspection target Fuel Assembly

#### O.5.1.2 Inspection List

Extent of PIIP shall include as a minimum:







Dukovany	NUCLEAR FUEL CONTRACT
5&6	APPENDIX O

Page 6/9

O.5.2 ME	ASUREMENTS THAT CAN BE PERFORMED WITH A FULLY EQUIPPED	FRIE
的和数据数 数据编数		Land office
Participa Greek Cr		ener:
945,90449981 945,655,755		
2008/377 2008/377		
2000	THE PARTY OF THE P	
927 (H)		

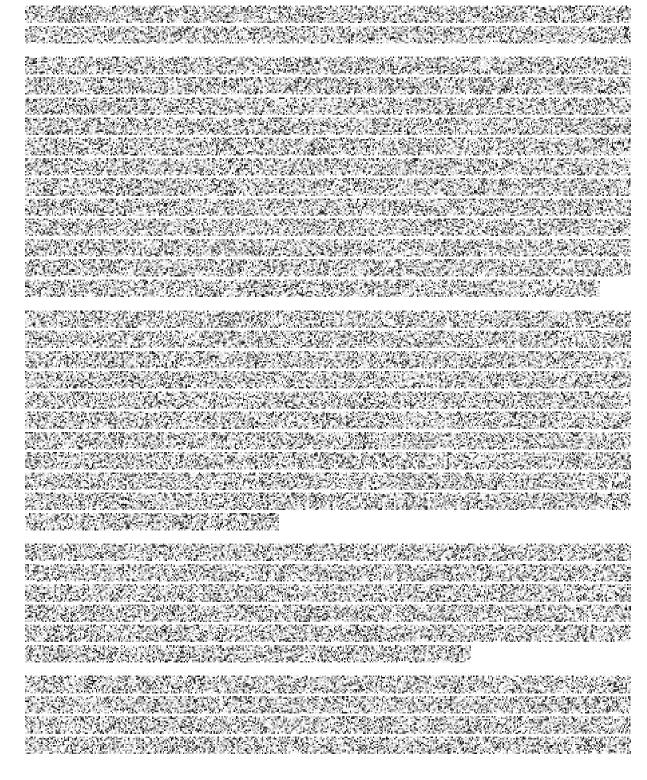


#### NUCLEAR FUEL CONTRACT APPENDIX O

Page 7/9

## O.6 METHODOLOGIES, PROCEDURES AND GUIDELINES FOR PIIP INSPECTIONS AND REPAIRS INCLUDING CRITERIA FOR EVALUATION OF FUEL ASSEMBLY AND CORE COMPONENTS CHARACTERISTICS

The Supplier shall perform PIIP and repairs as described in parts O.1, O.4 and O.5 in accordance with its methodologies, procedures and guidelines as specified in Appendix E.2.1 51).







#### NUCLEAR FUEL CONTRACT APPENDIX O

Page 8/9

			T. (1985) 151 (4) (20 - A 13 (4) (4) (5)		rgeneral programme Marie (1906-1907) zamen (1906-1907) Marie (1906-1907) zamen (1906-1907)	es Papartilles en A Paris Irice Paris	
	40 X 40 Z	The San Trade	Pengagan Artika Masaban Kabupatèn	96			
E RETU				Type of the service o			155 155 156
							iorg
2/2 z 3/2							907 (1900) 64 (1240) 64 (1240) 74 (1250)



Dukovany
5&6

NUCLEAR FUEL CONTRACT
APPENDIX O

Page
9/9

#### 0.7 EVALUATION OF PREDICTED TO MEASURED VALUES AND PIIP REPORT

After each PIIP campaign, Supplier shall evaluate PIIP data, compare PIIP data with the expected results defined in Parts O.2 and deliver a PIIP report to Owner.

#### **0.8 PIIP AND FUEL REPAIR RELATED PROVISION OF MEANS OF FUEL MANAGEMENT**

PIIP and fuel assembly repair related provision of the Means of Fuel Management shall be provided by Supplier to Owner as defined in Articles 2.2.4.7 and 2.2.4.9 h) and in Appendices H, I and J.





#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 1/60

## NUCLEAR FUEL CONTRACT APPENDIX P

**DOCUMENT NAME:** 

NUCLEAR FUEL CONTRACT
APPENDIX P





#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 2/60

#### P - IMPLEMENTATION PROGRAM

The Implementation Program is defined in Article 2.2.1 of the NFC and shall also include items specified below in Parts P.1 - P.4.

Implementation Program shall be divided into two phases, as specified in Appendix R, Part R.1.1 The individual stages of each phase of the Implementation Program (and respective milestones ending the individual stages) referred to in Part R.1.1 of Appendix R are specified in Tables P.1.1 and P.1.2 below.

Table P.1.1: Implementation Program stages related to the phase leading to application for license(s) for construction

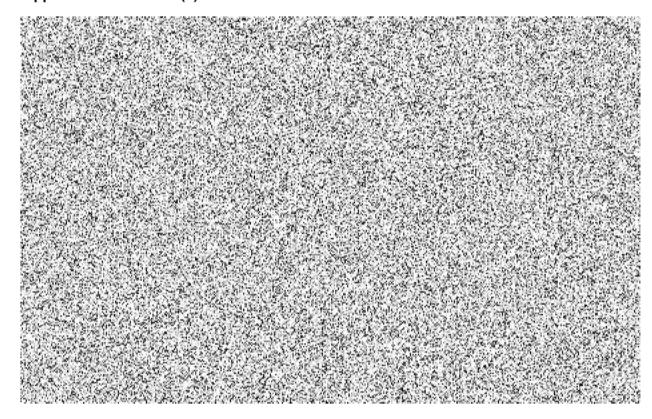
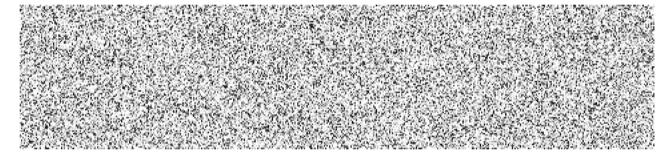


Table P.1.2: Implementation Program stages related to the phase leading to application for license(s) for operation

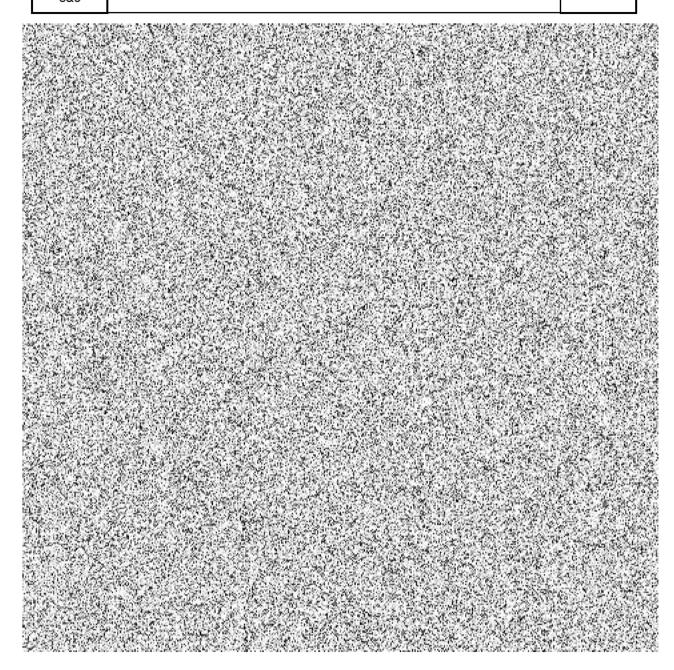






#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 3/60





#### NUCLEAR FUEL CONTRACT APPENDIX P

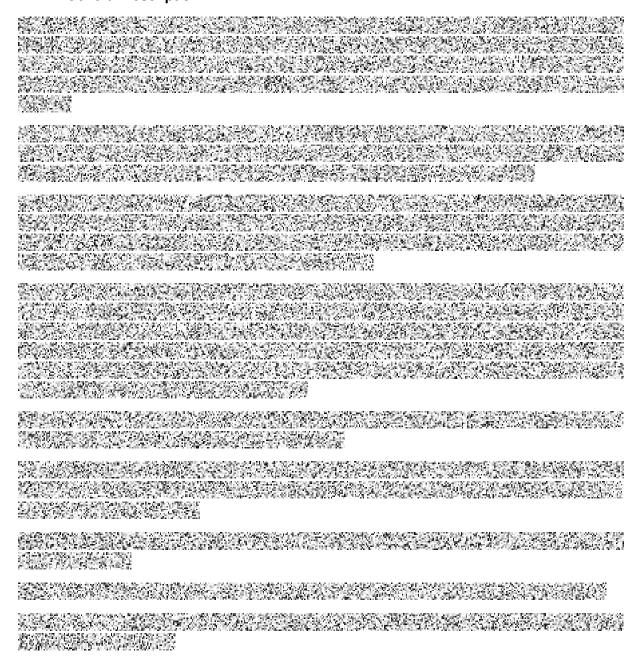
Page 4/60

#### P.1 QUALITY MANAGEMENT PROGRAM

In accordance with Chapter 20 of the NFC, Supplier shall develop a Quality Management Program for the entire NFC Work.

#### **P.1.1 INTRODUCTION**

#### P.1.1.1 General Description



#### **P.1.2 GENERAL REQUIREMENTS**

PQM will comply with the requirements specified in EPC contract and NFC agreed between the Owner and KHNP.



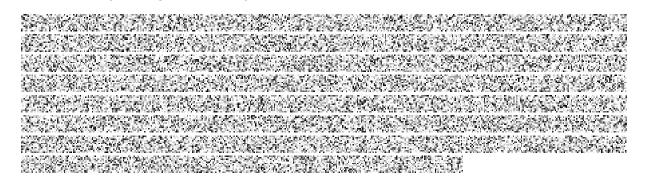


#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 5/60

#### **P.1.3 QUALITY MANAGEMENT PROGRAM**

#### P.1.3.1 Quality Management Policy







#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 6/60

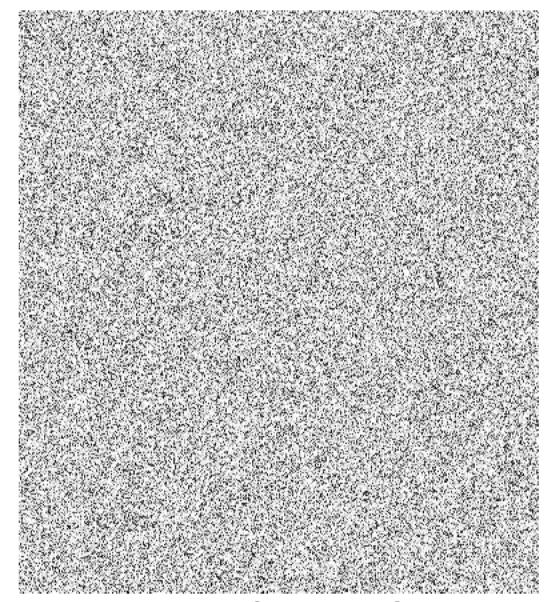


Figure P.1.1: KHNP's Quality Management System



#### P.1.3.2 Nuclear Safety Culture

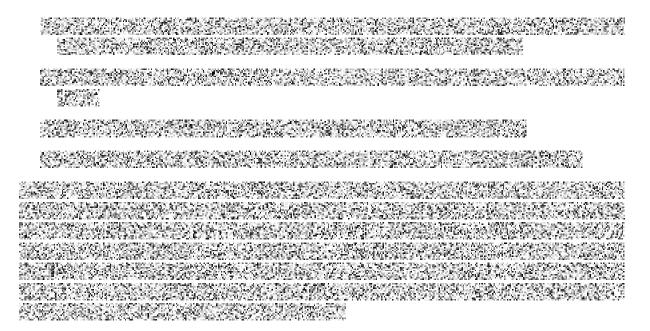






#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 7/60



## P.1.3.3 Graded Approach

KHNP will apply the management requirements to the Project by using a graded approach with the following consideration;







#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 8/60

## Table P.1.3 Graded Approach for KHNP

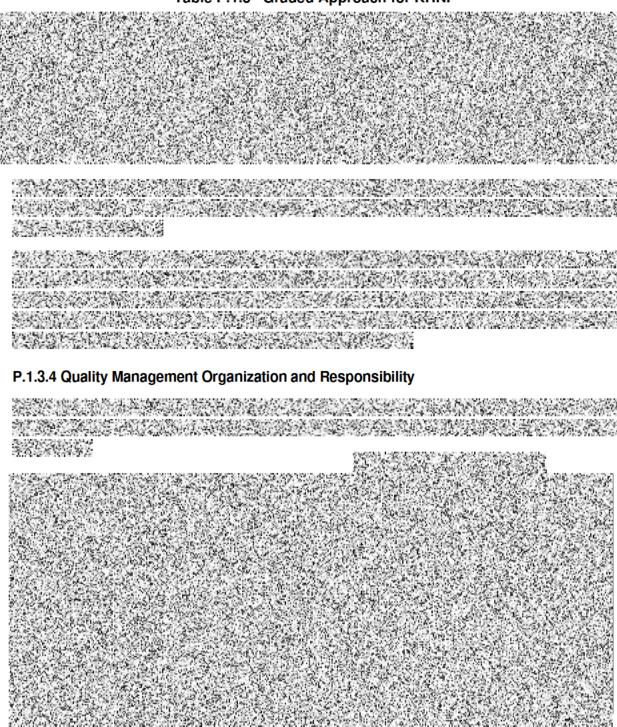


Figure P.1.2 Project Organization for Quality Management In KHNP







Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX P	9/60

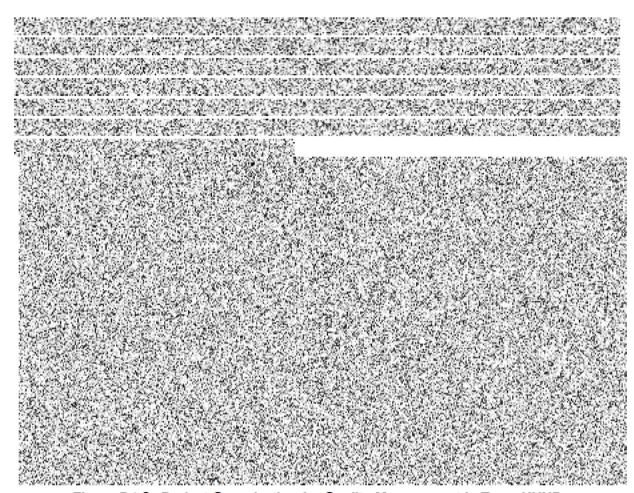
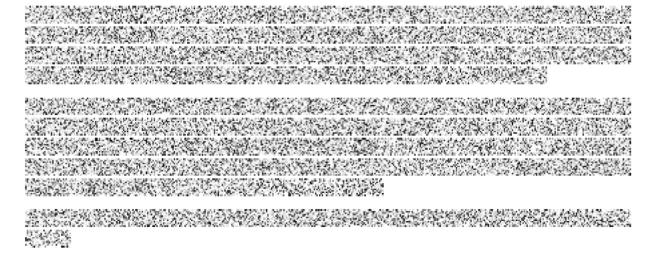


Figure P.1.3 Project Organization for Quality Management In Team-KHNP

#### P.1.4 DOCUMENTATION





Dukovany 5&6  NUCLEAR FUEL CONTRACT APPENDIX P	Page 10/60
--	---------------

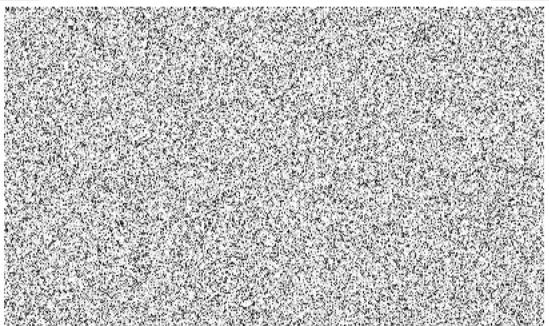


Figure P.1.4 Structure of Quality Documents





## NUCLEAR FUEL CONTRACT APPENDIX P

Page 11/60

Process of Review the Quality Document
Quality Document Review
Control of Quality Document review results
P.1.5 QUALITY RECORDS AND REPORTS





#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 12/60

第3章 28編	

### P.1.5.1 Process of Records and Reports



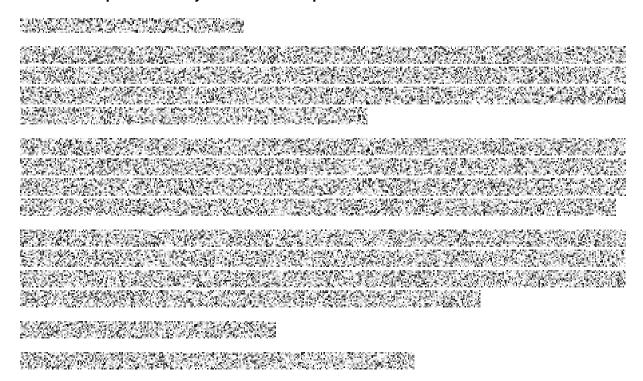




#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 13/60

## P.1.5.2 Examples of Quality Records and Reports







## NUCLEAR FUEL CONTRACT APPENDIX P

Page 14/60

The state of the s



## NUCLEAR FUEL CONTRACT APPENDIX P

Page 15/60

的工程,是在1000年的中央企业的企业的企业的 2000年,1000年的中央企业的企业的企业的企业的企业的企业的企业的企业的企业的企业的企业的企业的企业的企





#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 16/60



Dukovany
586

## NUCLEAR FUEL CONTRACT APPENDIX P

Page 17/60

P.1.5.3 Evaluation of Effectiveness of Quality Management System
P.1.5.4 Trend Analysis for Non-conformances and Corrective Actions (NCR and CAR)





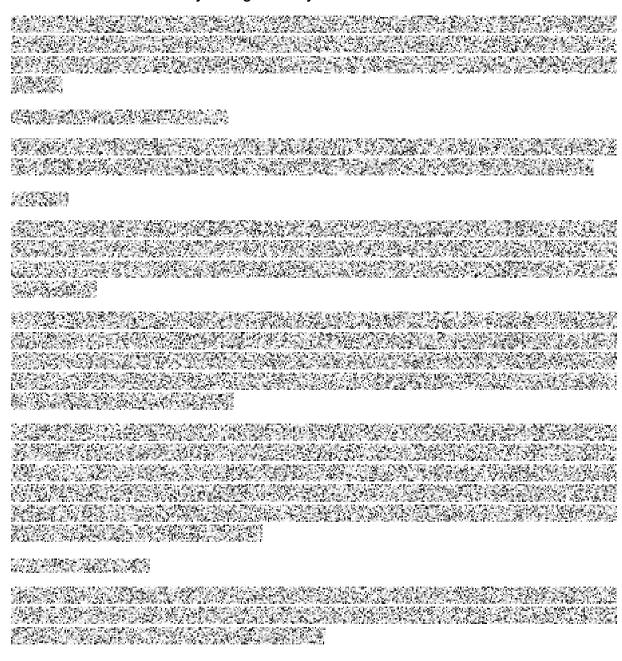
#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 18/60

#### P.1.6 QUALITY VERIFICATION



## P.1.6.1 Verification of Quality Management System







## NUCLEAR FUEL CONTRACT APPENDIX P

Page 19/60

## P.1.6.2 Verification of Products





## NUCLEAR FUEL CONTRACT APPENDIX P

Page 20/60

restriction of the state of the
LO CONTRAL PERSONAL CONTRAL CONTRAL SERVICE AND A MANAGEMENT OF THE SERVICE AND A TOTAL OF CONTRAL SERVICE AND THE THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE SERVICE AND THE SERVICE AND THE PROPERTY OF THE PROPERT
CONTROL OF CONTROL OF THE ARMOUND OF THE THE PROPERTY OF THE CONTROL OF THE PROPERTY OF THE PR
ATTERNA MENTENNA STERRE DER STERR Der Sterre der Sterre Der Sterre der Sterre
AND THE STATE OF T



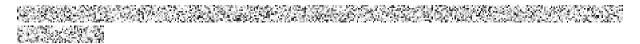


#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 21/60

THE PARTY CONTRACTOR AND ADDRESS OF THE PARTY CONTRACTOR AND ADDRE
CANAL PROPERTY OF THE PROPERTY
等的。 10.1 在10.1 10.1 10.1 10.1 10.1 10.1 10.1

# P.1.6.3 Method of Detecting and Preventing Counterfeit, Fraudulent and Suspected Item (CFSI)







Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX P	22/60

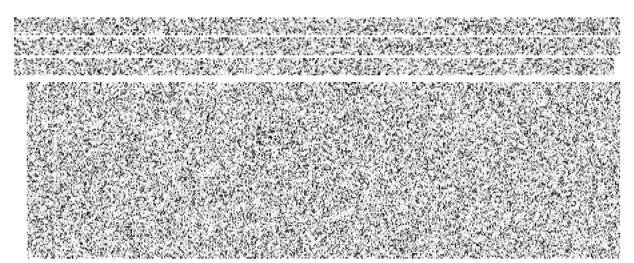
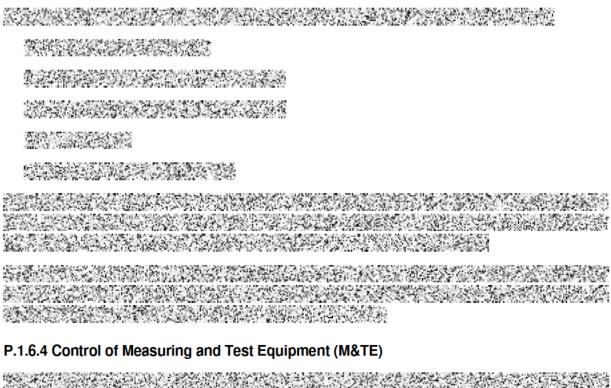


Figure P.1.5 Proposed CFSI verification scope









Dukovany 5&6 NUCLEAR FUEL CONTRACT APPENDIX P

Page 23/60

P.1.6.5 Commercial Grade Dedication (C
--



## P.1.7 LESSONS LEARNED

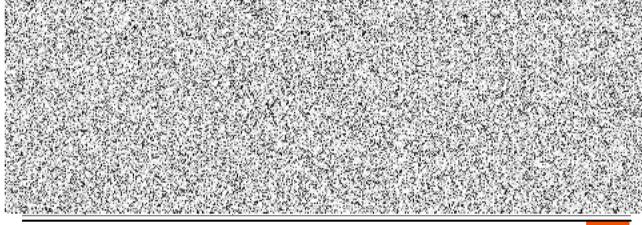


### P.1.8 PROCEDURES

KHNP will develop procedures needed for the project implementation based on the QMS and submit them to the Owner prior to project commencement. The procedures may be revised by reflecting the Owner's comments.

The procedures that KHNP have been using are shown as the Table P.1.4:

Table P.1.4 KHNP Procedure List for Oversea Business

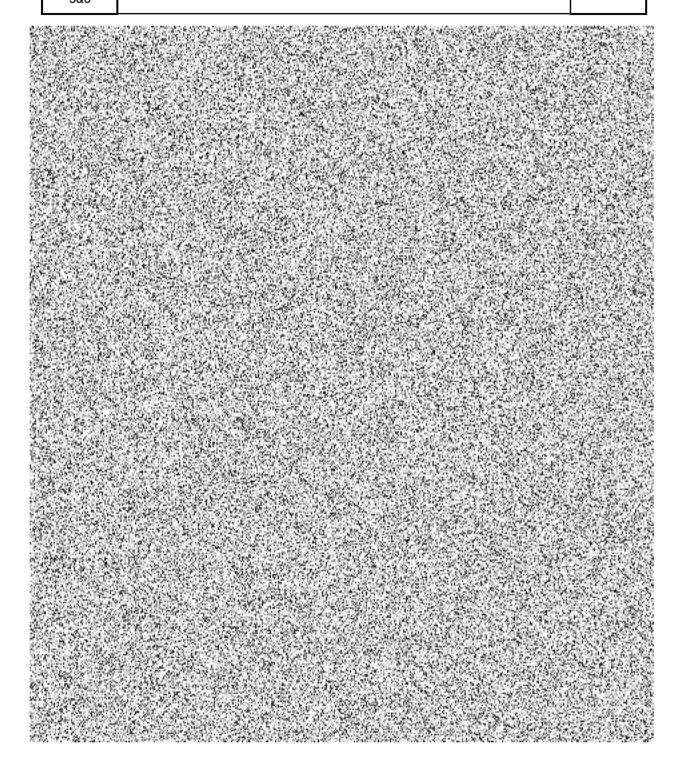






#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 24/60



## P.1.9 REFERENCE PLANT





## NUCLEAR FUEL CONTRACT APPENDIX P

Page 25/60



## NUCLEAR FUEL CONTRACT APPENDIX P

Page 26/60

## P.2 FUEL ROD, FUEL ASSEMBLY AND CORE COMPONENTS DESIGN

In accordance with Chapter 4 of the NFC, Appendix A and Appendix E, Supplier shall design the Fuel Rod, Fuel Assembly and Core Components for the Plant.

## **P.2.1 FUEL ASSEMBLY DESIGN**

这些情况的现在分词不可以在这种表现有可以是自己的人类的人,但是是一种人的人,但是是一种人的人的人,但是一种人的人们的人们的人们的人们的人们的人们们们们们们们们们
The Control of the Co
\$
A CONTROL OF THE PROPERTY OF T



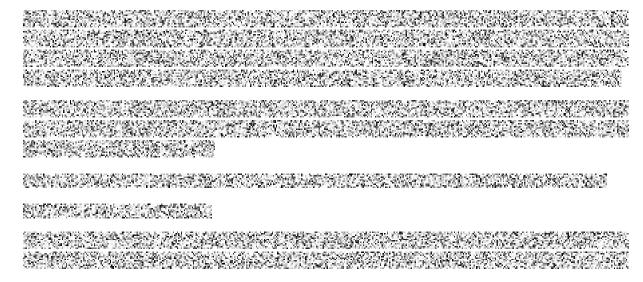


#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 27/60

\$27.505.50B \$27.505.50B

#### **P.2.2 FUEL ROD DESIGN**







#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 28/60

P.2.3 CONTROL ELEMENT ASSEMBLY DESIGN
P.2.4 FUEL SYSTEM DESIGN WITH CORE PHYSICS DESIGN REQUIREMENTS





## NUCLEAR FUEL CONTRACT APPENDIX P

Page 29/60

204.4.2.2.111.111.2.2.2.2.2.2.2.2.2.2.2.2.





## NUCLEAR FUEL CONTRACT APPENDIX P

Page 30/60

VACUUM TO THE PERSON OF THE PE





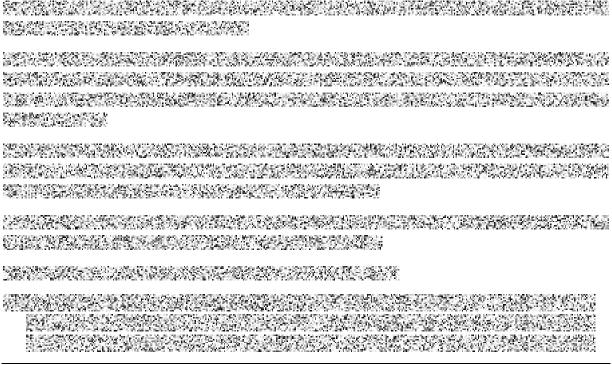
#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 31/60



As stated in the above paragraphs, all sub-functions assuring the reactivity distribution, reactivity control, and compensation shall satisfy the requirements of Regulatory Authority.

## P.2.5 THE PROCESS FOR ENSURING THAT THE PROPOSED DESIGNS SATISFY THE REQUIREMENTS







#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 32/60



## P.2.6 FUEL ASSEMBLY MECHANICAL CHARACTERISTICS





#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 33/60

To the Control of the

## P.2.7 CORE THERMAL AND HYDRAULIC CHARACTERISTICS







#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 34/60

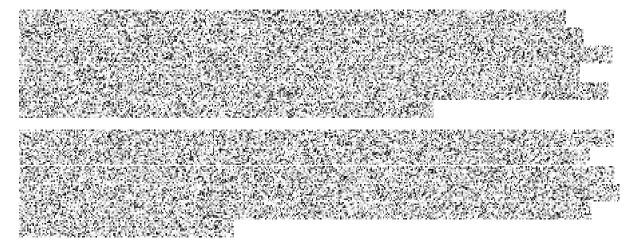
## INNER DE STATE DE LE STATE DE

Thermal hydraulic design bases for core are set to prevent fuel damage by thermal or hydraulic factors during steady state and AOOs and to produce the guaranteed thermal power. The following design limits are set to satisfy the design criteria during steady state and AOOs.



### P.2.7.4 Chapter 4 of the SAR

P.2.7.4.1 Fuel Rod Design (related to Chapter 4.2 of SAR)



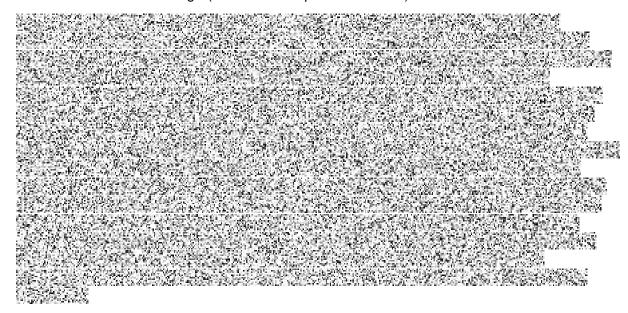




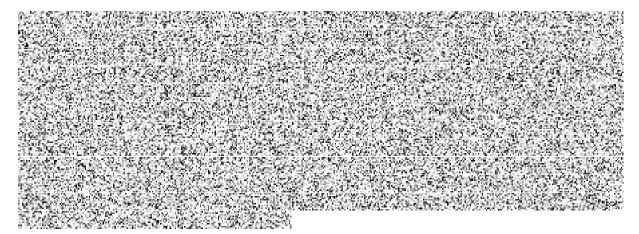
#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 35/60

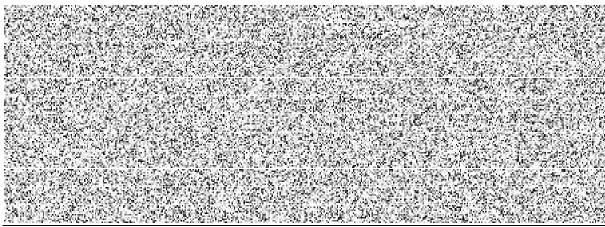
### P.2.7.4.2 Mechanical Design (related to Chapter 4.2 of SAR)



## P.2.7.4.3 Neutron-Physical design (related to Chapter 4.3 of SAR)



## P.2.7.4.4 Thermal-Hydraulic design, including DNB tests (related to Chapter 4.4 of SAR)



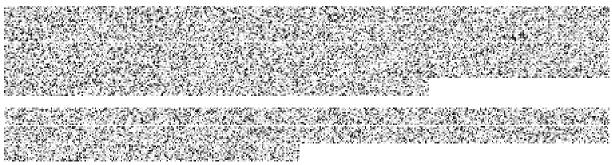




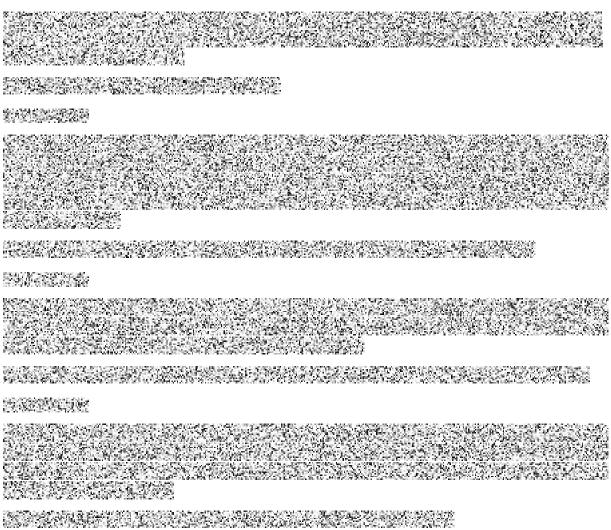
#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 36/60

P.2.8 INITIATING EVENTS IMPACTED BY A FUEL DESIGN (SAR CHAPTER 15	CASES)
DOG INITIATING EVENTO INDACTED BY A FUEL DECION (OAD QUARTED 45	04050)
ANTERIOR DE TENERO DE LA COMPANIO D LA COMPANIO DE LA CO LA COMPANIO DE LA CO	RESOURCE CONTRACTOR SERVICES
	是不是是有效



## 15.1 Increase in heat removal by the secondary system

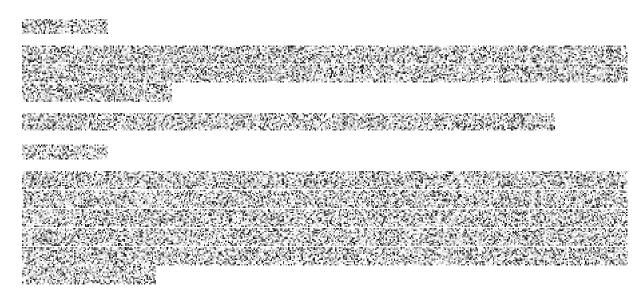






#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 37/60



## 15.2. Decrease in heat removal by the secondary system

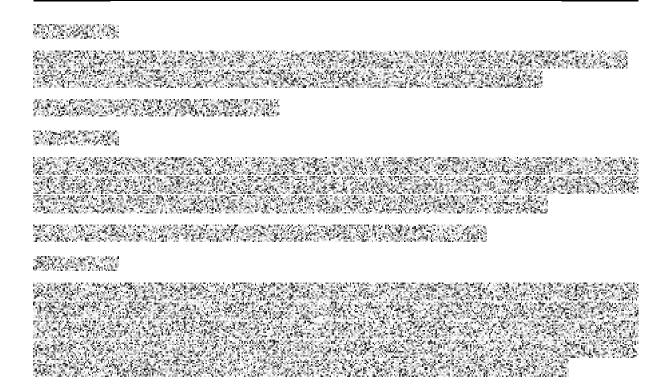




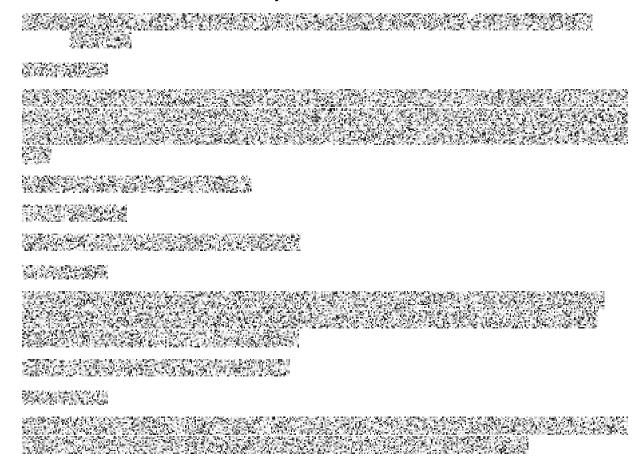


#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 38/60



## 15.3 Decrease in reactor coolant system flow rate







#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 39/60

## 15.4 Reactivity and power distribution anomalies (RIA)





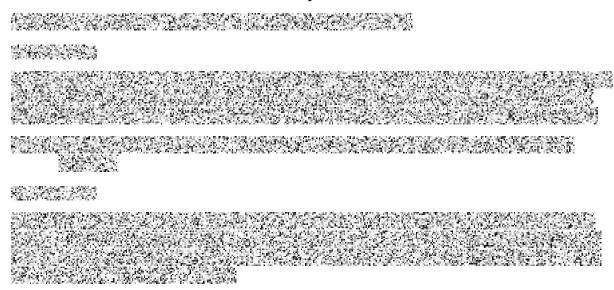


#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 40/60



### 15.5 Increase in reactor coolant inventory



#### 15.6 Decrease in reactor coolant inventory

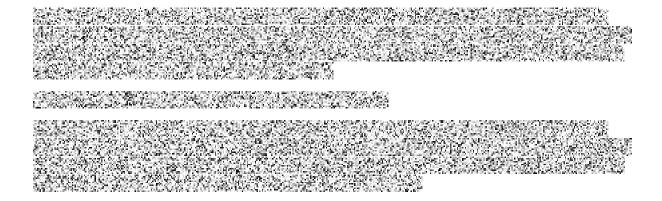






#### NUCLEAR FUEL CONTRACT APPENDIX P

Page 41/60



#### 15.7 Postulated 15.7 events



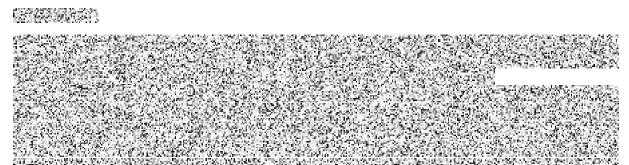




Dukovany NUCLEAR FUEL CONTRACT
APPENDIX P

Page 42/60

## 15.8 Anticipated Transients Without Scram





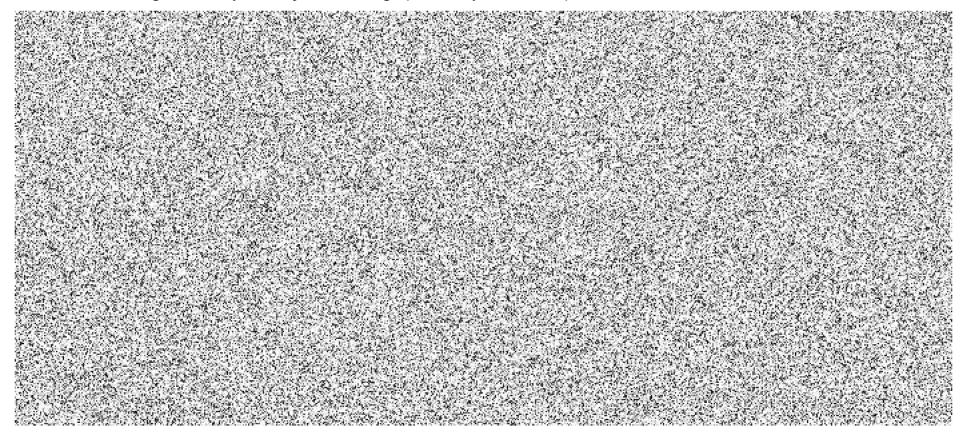


Dukovany
5&6

NUCLEAR FUEL CONTRACT
APPENDIX P

43/60

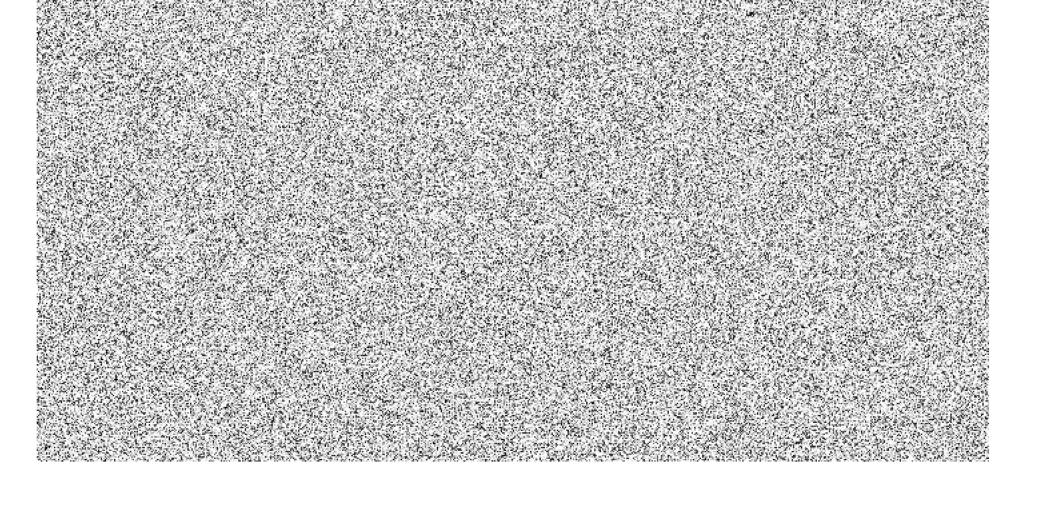
## Table P.2.2 Initiating events impacted by a Fuel Design (SAR Chapter 15 cases)





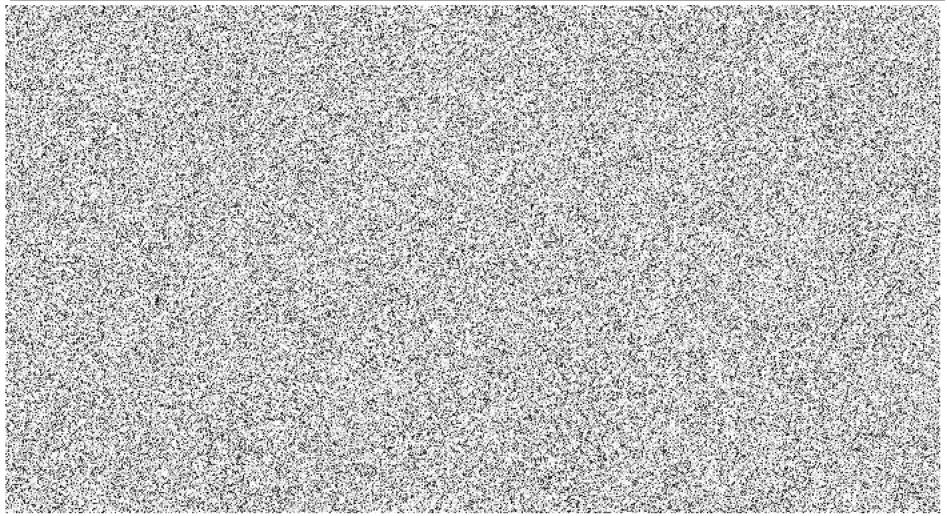


Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX P	44/60



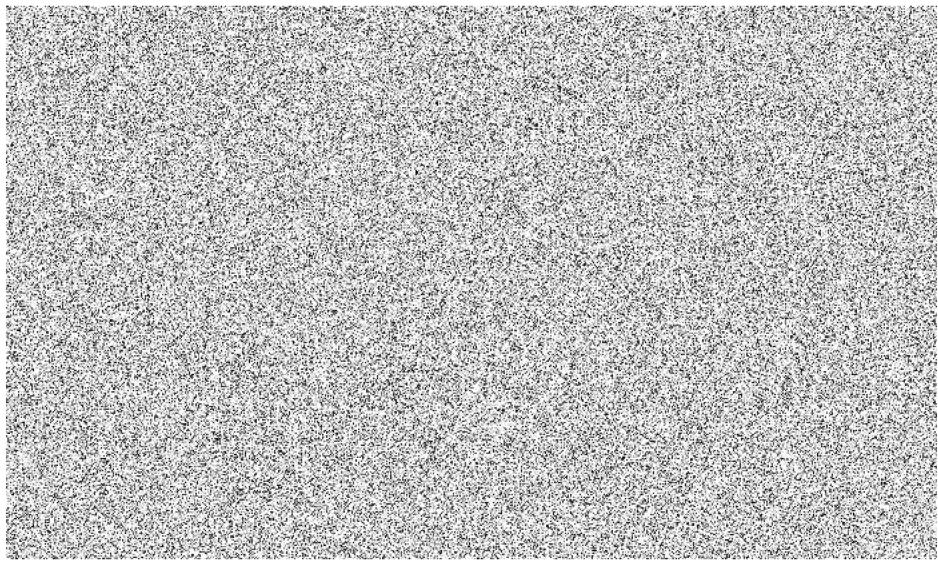


Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX P	45/60



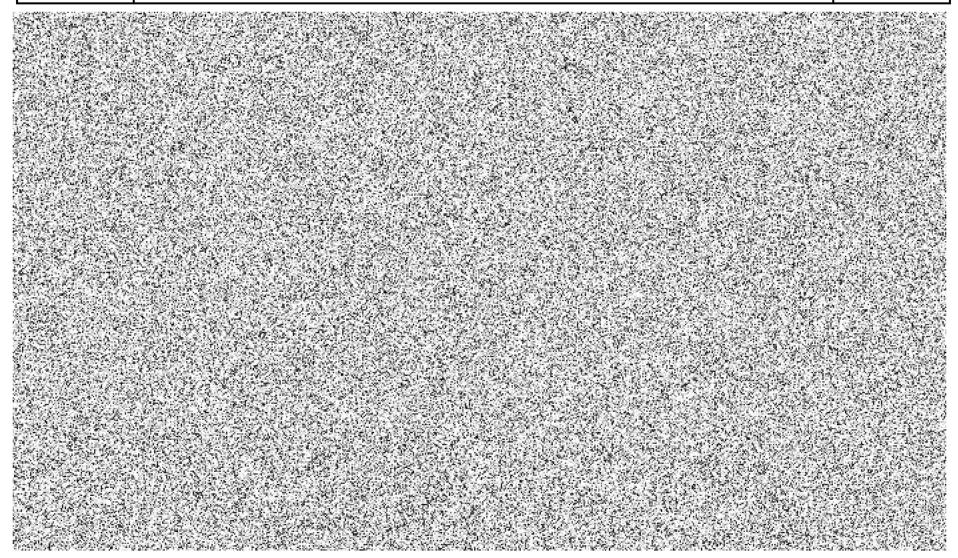


Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX P	46/60
AND THE ADDISON DESCRIPTION OF THE SAME OF		





Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX P	47/60





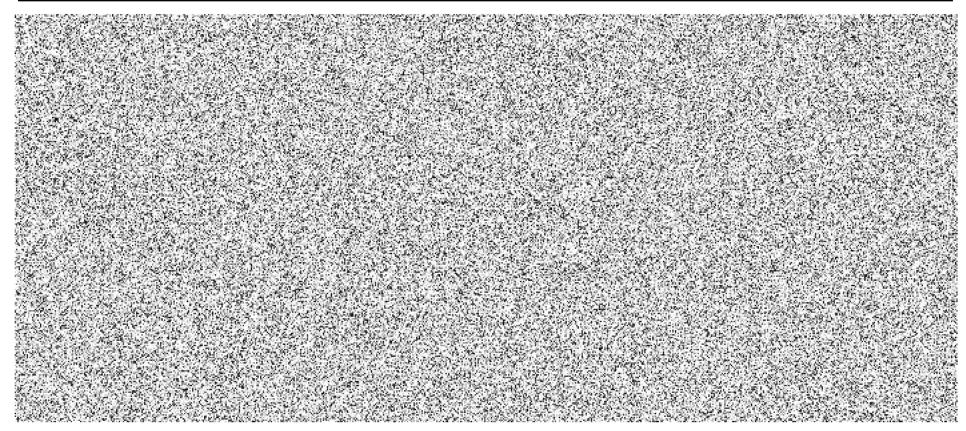


Dukovany 5&6	NUCLEAR FUEL CONTRACT APPENDIX P	Page 48/60





Dukovany 5&6  NUCLEAR FUEL CONTRACT APPENDIX P	Page 49/60
--	---------------







Dukovany	NUCLEAR FUEL CONTRACT	Page
5&6	APPENDIX P	50/60

