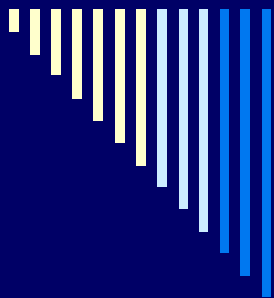



ایمنی در برق



POWEREN.IR

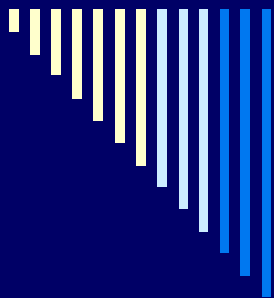


- مقدمه
- سیستم مجوز کار
- **خطرات برق**
- روشهای جلوگیری از برق گرفتگی
- کمکهای اولیه به حادثه دیده



تعریف ایمنی:

□ عبارتست کلیه مواردی که جهت حفظ سلامتی شخص یا تجهیزات باید انجام گیرد.



سیستم مجوز کار

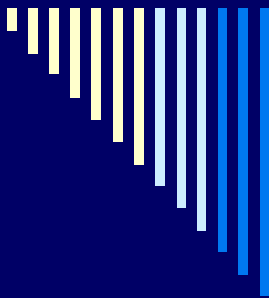
□ تحت کنترل در آوردن فعالیتهای جاری در سایت

رعایت موارد ایمنی

مشخص شدن مسوولیتها

مستند سازی

قابلیت ردیابی



		HOT WORK		Permit No. 1011		No. of Workmen			
Permit Expires				Continuation of					
Date		Originator		Company		Duration			
1 Initiator									
Location				Tag No.					
Description of Work				Specific Means		Additional Documents			
				Mach. Handling		Switch/Clamp			
				Lifting/Rigging		Procedure			
				Work at Height		Fall List			
				Scaffold		Permit List			
				Road Closure		PSSD			
Initiator Name: _____				Signed: _____		Breathing Air UVE Use: <input type="checkbox"/> Yes <input type="checkbox"/> No			
2 Safety Requirements									
Eye protection		<input type="checkbox"/> Yes <input type="checkbox"/> No	Only Depressurization/Isolation		<input type="checkbox"/> Yes <input type="checkbox"/> No	Barriers / Warning Signs		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Hearing Protection		<input type="checkbox"/> Yes <input type="checkbox"/> No	Extinguisher/Fire Hood/Fire Blanket		<input type="checkbox"/> Yes <input type="checkbox"/> No	MOC Required		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Harness / Life Line		<input type="checkbox"/> Yes <input type="checkbox"/> No	Buddy Fire and Rescue Team		<input type="checkbox"/> Yes <input type="checkbox"/> No	Non-Spark Tools Required		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Fire Watch / Stand by Man		<input type="checkbox"/> Yes <input type="checkbox"/> No	Electrical Isolations Required		<input type="checkbox"/> Yes <input type="checkbox"/> No	Scaffold Work Required		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Other Safety Requirements:									
Safety Authority		Name: _____		Signed: _____		Date: _____		Time: _____	
3 Plant Status Requirements									
Equipment is physically isolated		<input type="checkbox"/> Yes <input type="checkbox"/> No	Isolation Authority to Define		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Equipment isolated by valves		<input type="checkbox"/> Yes <input type="checkbox"/> No	All drains are closed		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Equipment fully depressurized		<input type="checkbox"/> Yes <input type="checkbox"/> No	Equipment fully tested		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Equipment is fully drained		<input type="checkbox"/> Yes <input type="checkbox"/> No	Equipment inert		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Equipment is purged of gas / vapor		<input type="checkbox"/> Yes <input type="checkbox"/> No	Other		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Area Authority to Define		Name: _____		Signed: _____		Date: _____		Time: _____	
4 Fire and Gas, ESD System Requirement									
Fire and Gas detectors inhibited		<input type="checkbox"/> Yes <input type="checkbox"/> No	Area Authority to Define		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Emergency System inhibited		<input type="checkbox"/> Yes <input type="checkbox"/> No	Area Authority to Define		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Emergency System inhibited		<input type="checkbox"/> Yes <input type="checkbox"/> No	Area Authority to Define		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Emergency System inhibited		<input type="checkbox"/> Yes <input type="checkbox"/> No	Area Authority to Define		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Any part of ESD System overridden		<input type="checkbox"/> Yes <input type="checkbox"/> No	Area Authority to Define		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Senior Permit Operator		Name: _____		Signed: _____		Date: _____		Time: _____	
5 Complementary Permits									
Confined Space Entry		<input type="checkbox"/> Yes <input type="checkbox"/> No	The following complementary permits are required to the work. Area Authority to check and confirm		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Radiography		<input type="checkbox"/> Yes <input type="checkbox"/> No	Revised No.		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Excavation		<input type="checkbox"/> Yes <input type="checkbox"/> No	Revised No.		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
Mechanical Isolation		<input type="checkbox"/> Yes <input type="checkbox"/> No	Revised No.		<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____		Date: _____	
6 Authorisation									
Area Authority		By signing the section below the Area Authority authorizes the work to proceed, as detailed in this permit and any attached complementary permits.							
Name: _____		Signed: _____		Date: _____		Time: _____			
7 Permit Control									
Permit Controller		By signing the section below the Permit Controller has checked this permit and the work may proceed, as detailed in this permit and any attached complementary permits.							
Name: _____		Signed: _____		Date: _____		Time: _____			
8 Validation									
Task Supervisor		By signing the section below the Task Supervisor accepts the responsibility for carrying out the work, as detailed in this permit and any attached complementary permits, and in accordance with all requirements specified herein.							
Name: _____		Signed: _____		Date: _____		Time: _____			
9 Cancellation / Suspension									
The Work has been COMPLETED / SUSPENDED and the site inspected. No unauthorised modifications have been carried out, all tools and equipment have been removed and the work area is clean and tidy.									
Fire and Gas Systems are returned to normal		<input type="checkbox"/> Yes <input type="checkbox"/> No	ESD Systems are returned to normal		<input type="checkbox"/> Yes <input type="checkbox"/> No				
Task Supervisor, Name/Date: _____		Area Authority, Name/Date: _____		Permit Controller, Name/Date: _____					
Distribution: _____		Copy 1 - Work Site		Copy 2 - Safety Authority		Copy 3 - Permit Controller		Copy 4 - Area Authority	

5

Complementary Permits

The following complementary permits are required for the works. Area Authority to check and confirm.

			Renewal No.					Renewal No.
Confined Space Entry	Yes	No	CE -		Sanction for Test	Yes	No	CS -
Radiography	Yes	No	CR -		HV Electrical Isolation	Yes	No	CH -
Excavation	Yes	No	CX -		LV Electrical Isolation	Yes	No	CL -
Mechanical Isolation	Yes	No	CP -		Limitation of Access	Yes	No	CA -

6

Authorisation

By signing the section below the Area Authority authorises the work to proceed, as detailed in this permit and any attached complementary permits.

Area Authority: Name: Signed: Date: Time:

7

Permit Control

By signing the section below the Permit Controller has checked this permit and the work may proceed, as detailed in this permit and any attached complementary permits.

Permit Controller: Name: Signed: Date: Time:

8

Validation

By signing the section below the Task Supervisor accepts the responsibility for carrying out the work, as detailed in this permit and any attached complementary permits, and in accordance with all requirements specified therein.

Approval					Handback				
Date	Task Supervisor	Area Authority	Permit Controller	Valid Until	Task Supervisor	Area Authority	Permit Controller	Site/Equip Status	Time

9

Cancellation / Suspension

The Work has been COMPLETED / SUSPENDED and the site inspected. No unauthorised modifications have been carried out, all tools and equipment have been removed and the work area is clean and tidy.

Fire and Gas Systems are returned to normal	Yes	No	ESD Systems are returned to normal	Yes	No
---	-----	----	------------------------------------	-----	----

Task Supervisor, Name/Date : Area Authority, Name/Date : Permit Controller, Name/Date :

Distribution: Copy 1: Work Site Copy 2: Safety Authority Copy 3: Permit Controller Copy 4: Area Authority

COMPLEMENTARY PERMIT FOR LIMITATION OF ACCESS

1 AUTHORIZATION for COMPLETION and ISSUE

Main Permit No.

Senior Authorised
Elect. Person

Name:

Signature:

Date:

Time:

2 WORK DESCRIPTION

Issued to:

In charge of the work:

Equipment:

Tag No.

Work/testing to be carried out:

NO WORK ON EQUIPMENT OR ACCESS TO AREA OTHER THAN STATED ABOVE IS PERMITTED

Limits of work/testing to be carried out, or work area and precautions to be applied:

Senior Authorised
Elect. Person

Name:

Signature:

Date:

Time:

3 RECEIPT

I hereby declare that I accept my responsibility under T&E Electrical Safety Rules and in accordance with the requirements specified on the permit and acknowledge receipt of the terms in Section 2 of this permit to work.

Task supervisor:

Name:

Signature:

Date:

Time:

4 CLEARANCE

I hereby declare that work / testing under my control of this Limitation of Access Permit to Work has been COMPLETED / SUSPENDED and that it is no longer safe to work on the plant specified above and that all tools and equipment have been removed.

Task supervisor:

Name:

Signature:

Date:

Time:

5 CANCELLATION

I hereby declare that work / testing to be carried out under this Limitation of Access Permit to Work has been COMPLETED / SUSPENDED and that this Limitation of Access permit has been cancelled.

Senior Authorised
Elect. Person

Name:

Signature:

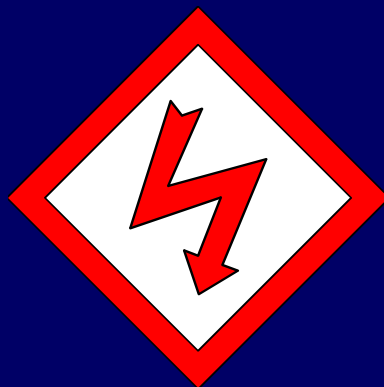
Date:

Time:

6 NOTES

1. This Limitation of Access Certificate is an authority in writing for issue to a person about to work in the vicinity of live electrical

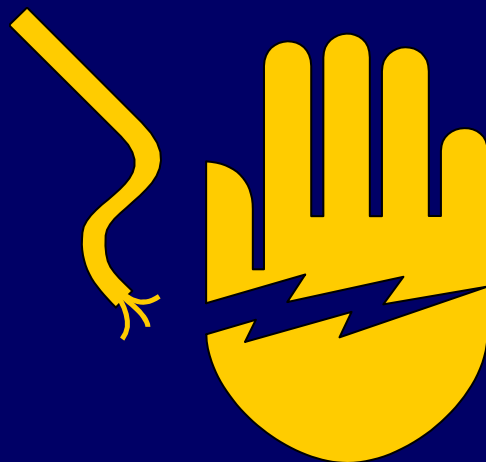
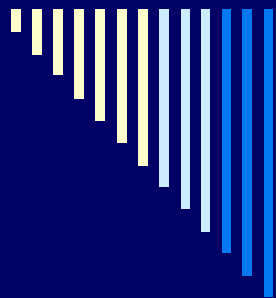
خطرات برق



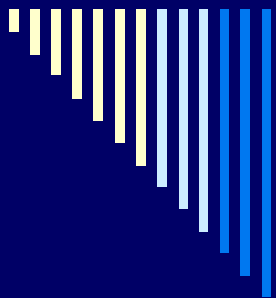
POWEREN.IR





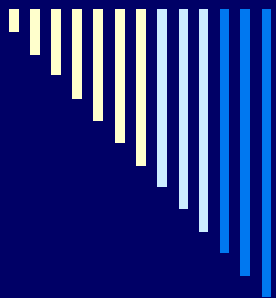


- خطر برق گرفتگی
- صدمه به تجهیزات
- ایجاد آتش سوزی یا انفجار



خطرات برق گرفتگی بستگی به:

- مسیر جریان
- میزان جریان
- طول زمان برقراری جریان



امپدانس بدن انسان

□ امپدانس پوست در قسمت ورودی و خروجی

□ امپدانس داخلی بدن



امپدانس پوست بدن

مقاومت پوست بدن را میتواند به صورت تعداد بیشماری مقاومت و خازن موازی تصور نمود.

□ امپدانس پوست بدن بستگی به:

۱. ولتاژ
۲. فرکانس
۳. زمان برقراری جریان
۴. سطح کنتاکت
۵. فشار کنتاکت
۶. درجه رطوبت پوست
۷. دما

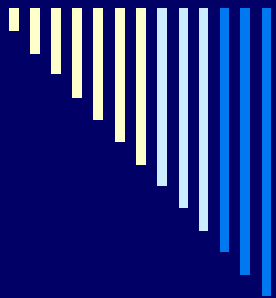


امپدانس داخلی بدن

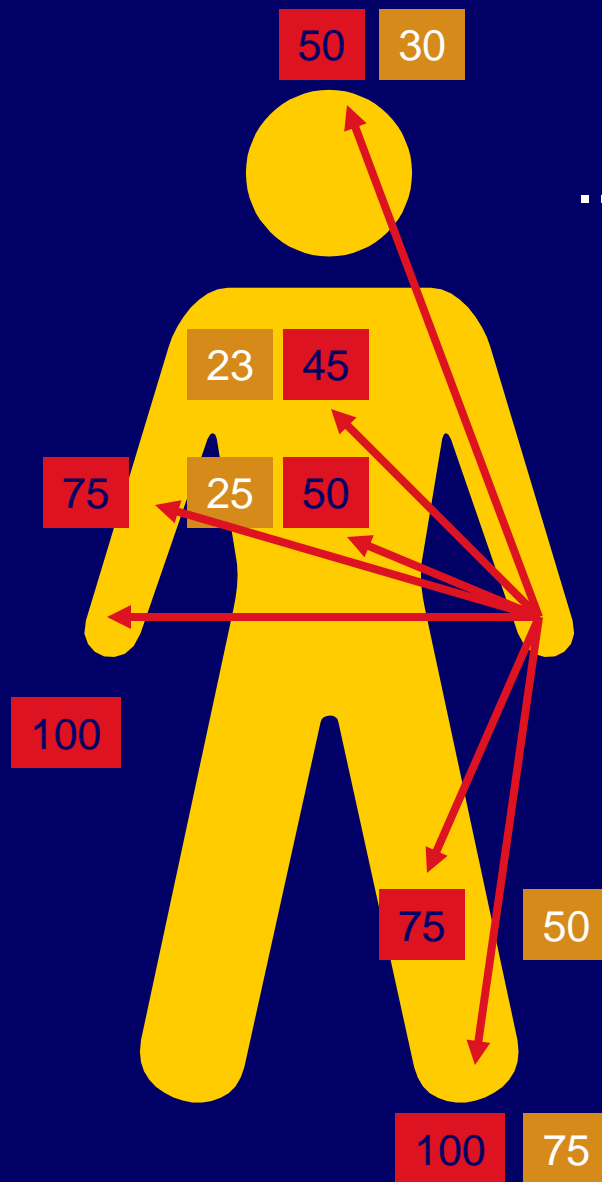
مولفه امپدانس داخلی بدن بزرگتر از مولفه خازنی آن است و میتوان آن را تنها مقاومت دانست

□ امپدانس داخلی بدن بستگی به:

۱. مسیر عبور جریان
۲. سطح تماس کنتاکتهای



آمپدانس بین یک دست و ...



مقادیر امپدانس کل بدن انسان

امپدانس	ولتاژ تماس
۳۲۵۰	۲۵
۲۶۲۵	۵۰
۲۲۰۰	۷۵
۱۸۷۵	۱۰۰
۱۳۵۰	۲۲۰
۱۱۰۰	۷۰۰
۱۰۵۰	۱۰۰۰



تأثيرات فيزيولوژيك جريان برق بر بدن

- قفل شدگی عضلات
- اشكال در تنفس
- بالا رفتن فشار خون
- اختلال در ضربان قلب
- فيبريلاسيون
- سوختگی



برق گرفتگی در نتیجه تماس با برق به دو صورت زیر پیش می آید:

□ تماس مستقیم

□ تماس غیر مستقیم

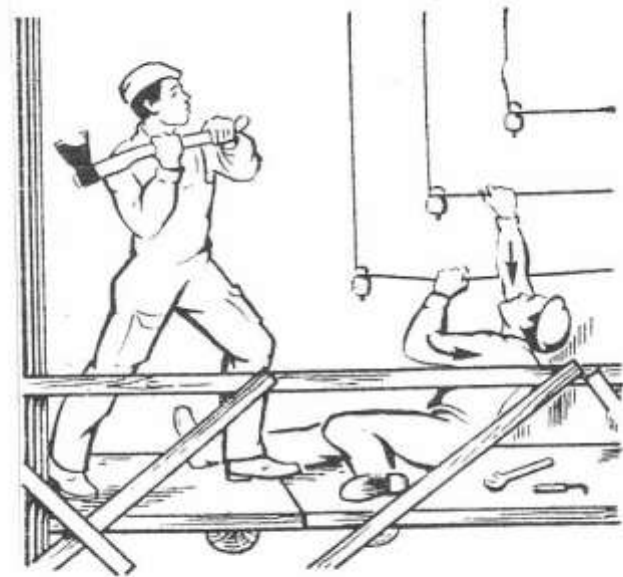
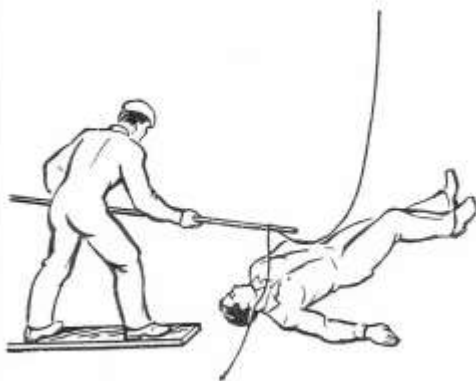
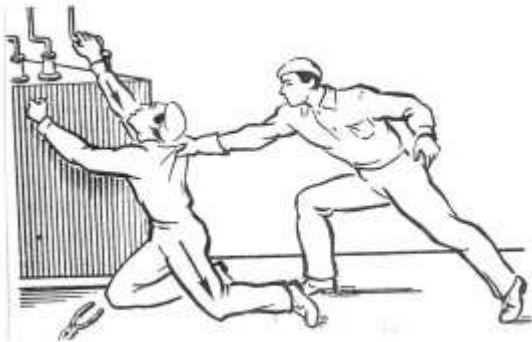


روشهای ایمنی در برابر برق گرفتگی

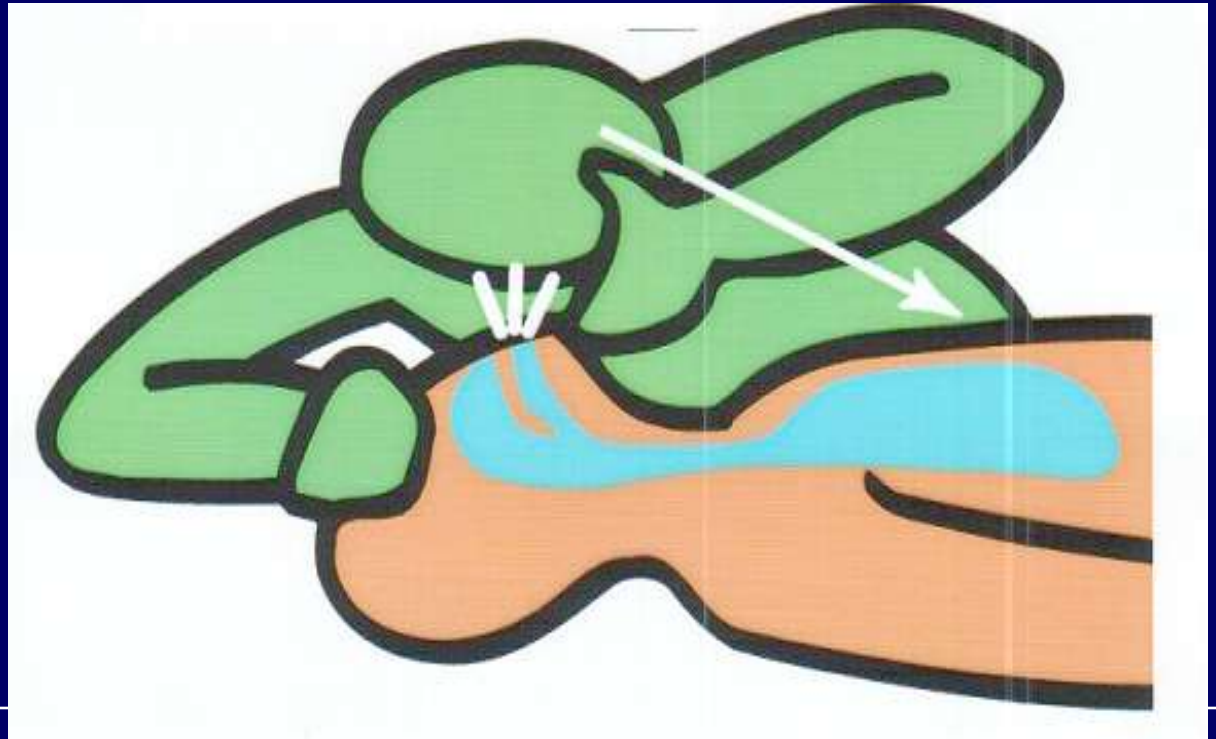
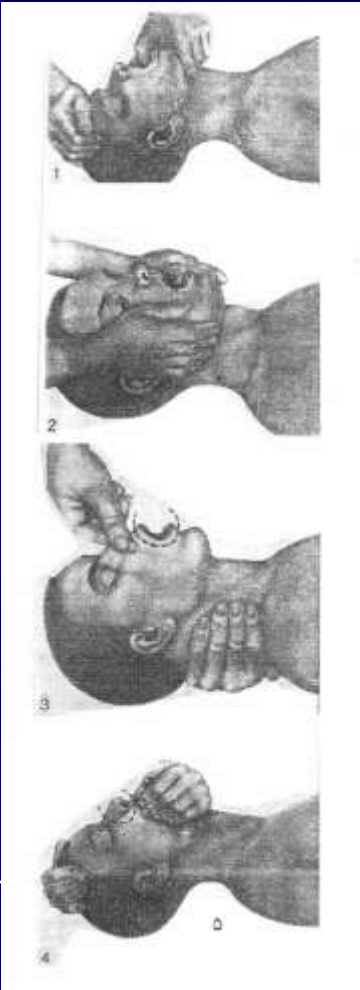
- رعایت حریم دسترسی به تجهیزات برقی، هادیهای برقدار
- حفاظت با استفاده از عایق بندی
- قطع سریع مدار در صورت بروز اتصالی فاز با بدنه هادی
- همبندی برای هم ولتاژ کردن

ک کمک های اولیه در برق گرفتگی

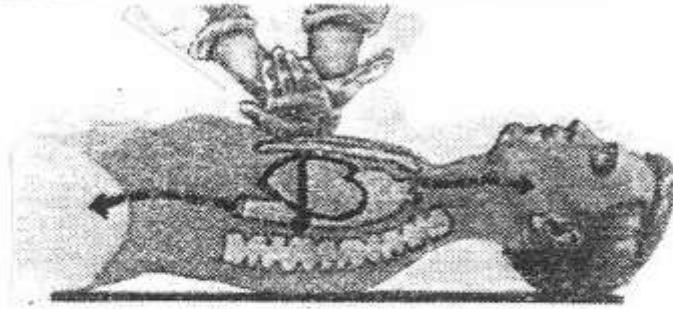
۱. قطع برق یا جدا کردن مصدوم از مدار با رعایت اصول ایمنی.



٢- تنفس مصنوعی



۳- ماساژ قلبی





پرمیت کمی ایزوله برقی

COMPLEMENTARY HIGH VOLTAGE ELECTRICAL ISOLATION PERMIT

1 INITIATOR Main Work Permit No.: Continuation Permit No.:
 Equipment : Tag No.:
 Nature of Work :
 Name : Signature :
 Company / Dept : Date :

2 AUTHORISATION for ISOLATION
 AREA AUTHORITY Name : Signature : Date :

3 DECLARATION
 Issued To : in charge of Work.
 Equipment TAG No.: Description :
 Type of Isolation required : NORMAL : OWN :
 Isolation of the above mentioned electrical equipment by :

	YES	N		YES	N
Breaker Switched Off			Removal of Control Fuses		
Racking Out / Down Breaker			Padlock (s) and Token (s) applied		
Shutters Locked			Warning Notice Posted on all Cubicles		
Switching Main Isolator to Off			Lock Off Extinguishant system		
Locked Off C.B. / Isolator			Heater Isolation		
Removal of Main Fuses			Motor disconnected		
No Voltage Checking			* Additional earthing		
Earthing at Cubicle					

* (Earthing Position (s) and No (s) etc.
 Details :

Padlock (s)	
Number	Location

I hereby declare that the isolation of the equipment mentioned in box 1, Tag No. has been checked by me, is safe to work on, is isolated from all live conductors, and is connected to earth, according to the requirements of TSP Electrical Safety Rules.
 SEN. AUTH. ELECT. PERSON Name : Signature : Date :

4 RECEIPT
 I hereby declare that I accept responsibility for carrying out work on the plant detailed on this permit in accordance with the requirements specified on the permit; no attempt will be made by me or persons under my control to work on any other plant.
 TASK SUPERVISOR Name : Signature : Date :

5A CLEARANCE
 I hereby declare that the work carried out under this permit has been COMPLETED / SUSPENDED and that all persons under my charge have been withdrawn and instructed that it is no longer safe to work on the plant specified above and that all equipment and tools have been removed.
 TASK SUPERVISOR Name : Signature : Date :

5B CANCELLATION
 I hereby declare that the work to be carried out under this permit has been COMPLETED / SUSPENDED. No further work may take place. The isolations may be removed when requested by the Area Authority.
 SEN. AUTH. ELECT. PERSON Name : Signature : Date :

6 AUTHORISATION for DE-ISOLATION
 AREA AUTHORITY Name : Signature : Date :

7 COMPLETION
 I hereby declare that the above Isolations have been removed and that the permit has been cancelled.
 SEN. AUTH. ELECT. PERSON Name : Signature : Date :

Copy 1 : Work Site Copy 2 : Safety Authority Copy 3 : Sen. Auth. Elect. Person Copy 4 : Electrical Switchroom

PERMIT No. CL

COMPLEMENTARY LOW VOLTAGE ELECTRICAL ISOLATION PERMIT

1 INITIATOR Main Work Permit No.: Continuation Permit No.:
 Equipment : Tag No.:
 Nature of Work :
 Name : Signature :
 Company / Dept : Date :

2 AUTHORISATION for ISOLATION
 AREA AUTHORITY Name : Signature : Date :

3 DECLARATION
 Issued To : in charge of Work.
 Equipment TAG No.: Description :
 Type of Isolation required : NORMAL : OWN :
 Isolation of the above mentioned electrical equipment by :

	YES	NO		YES	NO
Breaker Switched Off			Removal of Control Fuses		
Racking Out / Down Breaker			Padlock (s) and Token (s) applied		
Shutters Locked			Warning Notice Posted on all Cubicles		
Switching Main Isolator to Off			Lock Off Extinguishant system		
Locked Off C.B. / Isolator			Heater Isolation		
Removal of Main Fuses			Motor disconnected		
No Voltage Checking			* Additional earthing		
Earthing at Cubicle					

* (Earthing Position (s) and No (s) etc.
 Details :

Padlock (s)	
Number	Location

I hereby declare that the isolation of the equipment mentioned in box 1, Tag No. has been checked by me, is safe to work on, is isolated from all live conductors, and is connected to earth, according to the requirements of TSP Electrical Safety Rules.
 AUTH. ELECT. PERSON Name : Signature : Date :

4 RECEIPT
 I hereby declare that I accept responsibility for carrying out work on the plant detailed on this permit in accordance with the requirements specified on the permit; no attempt will be made by me or persons under my control to work on any other plant.
 TASK SUPERVISOR Name : Signature : Date :

5 CLEARANCE
 I hereby declare that the work carried out under this permit has been COMPLETED / SUSPENDED and that all persons under my charge have been withdrawn and instructed that it is no longer safe to work on the plant specified above and that all equipment and tools have been removed.
 TASK SUPERVISOR Name : Signature : Date :

6 AUTHORISATION for DE-ISOLATION
 AREA AUTHORITY Name : Signature : Date :

7 COMPLETION
 I hereby declare that the above Isolations have been removed and that the permit has been cancelled.
 AUTH. ELECT. PERSON Name : Signature : Date :

Copy 1 : Work Site Copy 2 : Safety Authority Copy 3 : Sen. Auth. Elect. Person Copy 4 : Electrical Switchroom

COMPLEMENTARY HIGH VOLTAGE ELECTRICAL ISOLATION PERMIT

1

INITIATOR

Main Work

Permit No. :

Continuation

Permit No. :

Equipment : _____ Tag No. : _____

Nature of Work : _____

Name : _____ Signature : _____

Company / Dept : _____ Date : _____

2

AUTHORISATION for ISOLATION

AREA AUTHORITY

Name : _____

Signature : _____

Date : _____

3

DECLARATION

Issued To : _____ in charge of Work.

Equipment TAG No. : _____ Description : _____

Type of Isolation required : _____ NORMAL : ☐ OWN : ☐

Isolation of the above mentioned electrical equipment by :

Breaker Switched Off

Racking Out / Down Breaker

Shutters Locked

Switching Main Isolator to Off

Locked Off C.B. / Isolator

Removal of Main Fuses

No Voltage Checking

Earthing at Cubicle

YES	N

Removal of Control Fuses

Padlock (s) and Token (s) applied

Warning Notice Posted on all Cubicles

Lock Off Extinguishant system

Heater Isolation

Motor disconnected

.....

* Additional earthing

YES	N

* (Earthing Position (s) and No (s) etc.

Details : _____

Padlock (s)	
Number	Location

I hereby declare that the isolation of the equipment mentioned in box 1, Tag No. _____ has been checked by me, is safe to work on, is isolated from all live conductors, and is connected to earth, according to the requirements of TSP Electrical Safety Rules.

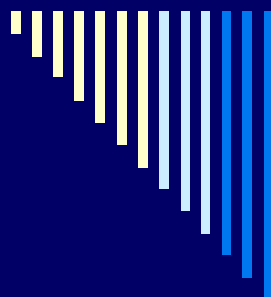
SEN. AUTH. ELECT. PERSON Name : _____ Signature : _____ Date : _____

4

RECEIPT

I hereby declare that I accept responsibility for carrying out work on the plant detailed on this permit in accordance with the requirements specified on the permit; no attempt will be made by me or persons under my control to work on any other plant.

TASK SUPERVISOR Name : _____ Signature : _____ Date : _____



5A **CLEARANCE**

I hereby declare that the work carried out under this permit has been COMPLETED / SUSPENDED and that all persons under my charge have been withdrawn and instructed that it is no longer safe to work on the plant specified above and that all equipment and tools have been removed.

TASK SUPERVISOR Name : _____ Signature : _____ Date : _____

5B **CANCELLATION**

I hereby declare that the work to be carried out under this permit has been COMPLETED / SUSPENDED. No further work may take place. The isolations may be removed when requested by the Area Authority.

SEN. AUTH. ELECT. PERSON Name : _____ Signature : _____ Date : _____

6 **AUTHORISATION for DE-ISOLATION**

AREA AUTHORITY Name : _____ Signature : _____ Date : _____

7 **COMPLETION**

I hereby declare that the above Isolations have been removed and that the permit has been cancelled.

SEN. AUTH. ELECT. PERSON Name : _____ Signature : _____ Date : _____

Copy 1 : Work Site Copy 2 : Safety Authority Copy 3 : Sen. Auth. Elect. Person Copy 4 : Electrical Switchroom

COMPLEMENTARY LOWVOLTAGE ELECTRICAL ISOLATION PERMIT

1 INITIATOR

Main Work Permit No.: _____ Continuation Permit No.: _____	Equipment: _____ Tag No.: _____ Nature of Work: _____ Name: _____ Signature: _____ Company / Dept: _____ Date: _____
---	---

2 AUTHORISATION for ISOLATION

AREA AUTHORITY	Name: _____	Signature: _____	Date: _____
----------------	-------------	------------------	-------------

3 DECLARATION

Issued To: _____ in charge of Work.

Equipment TAG No.: _____ Description: _____

Type of Isolation required: NORMAL: ☐ OWN: ☐

Isolation of the above mentioned electrical equipment by:

		YES	NO			YES	NO
Breaker Switched Off				Removal of Control Fuses			
Racking Out / Down Breaker				Padlock (s) and Token (s) applied			
Shutters Locked				Warning Notice Posted on all Cubicles			
Switching Main Isolator to Off				Lock Off Extinguishant system			
Locked Off C.B. / Isolator				Heater Isolation			
Removal of Main Fuses				Motor disconnected			
No Voltage Checking						
Earthing at Cubicle				* Additional earthing			

* (Earthing Position (s) and No (s) etc.

Details: _____

Padlock (s)	
Number	Location

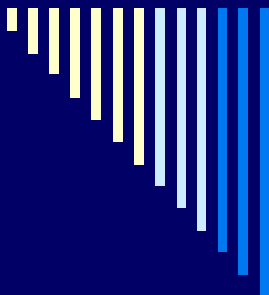
I hereby declare that the isolation of the equipment mentioned in box 1, Tag No. _____ has been checked by me, is safe to work on, is isolated from all live conductors, and is connected to earth, according to the requirements of TSP Electrical Safety Rules.

AUTH. ELECT. PERSON Name: _____ Signature: _____ Date: _____

4 RECEIPT

I hereby declare that I accept responsibility for carrying out work on the plant detailed on this permit in accordance with the requirements specified on the permit; no attempt will be made by me or persons under my control to work on any other plant.

TASK SUPERVISOR Name: _____ Signature: _____ Date: _____

**5****CLEARANCE**

I hereby declare that the work carried out under this permit has been COMPLETED / SUSPENDED and that all persons under my charge have been withdrawn and instructed that it is no longer safe to work on the plant specified above and that all equipment and tools have been removed.

TASK SUPERVISOR Name : _____ Signature : _____ Date : _____

6**AUTHORISATION for DE-ISOLATION**

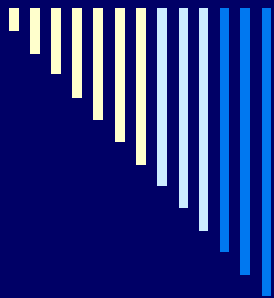
AREA AUTHORITY Name : _____ Signature : _____ Date : _____

7**COMPLETION**

I hereby declare that the above Isolations have been removed and that the permit has been cancelled.

AUTH. ELECT. PERSON Name : _____ Signature : _____ Date : _____

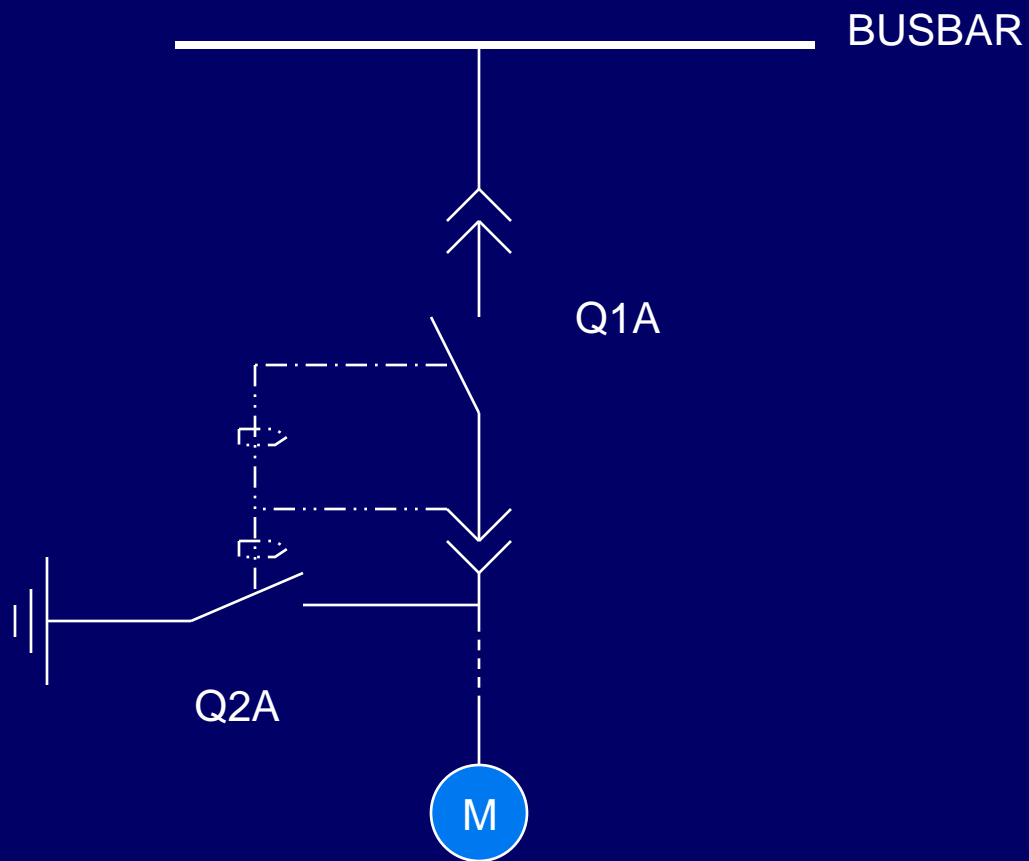
Copy 1 : Work Site Copy 2 : Safety Authority Copy 3 : Sen. Auth.Elect. Person Copy 4 : Electrical Switchroom



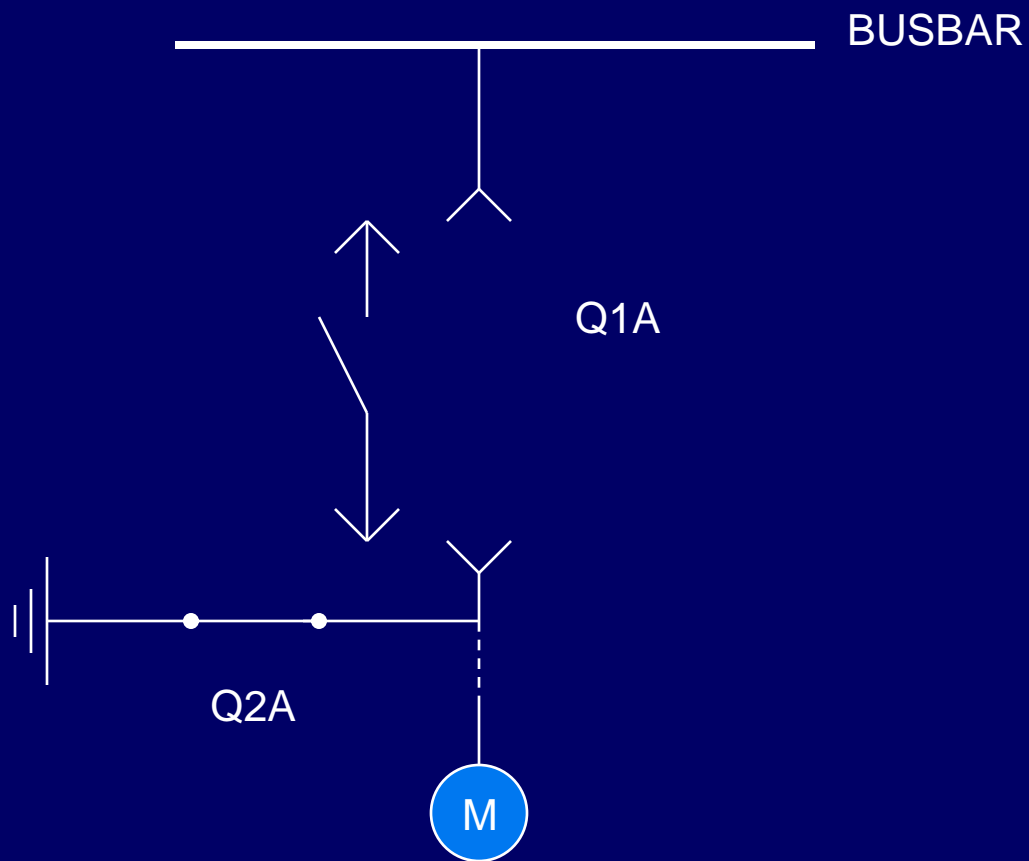
چه زمانی استفاده میشود؟

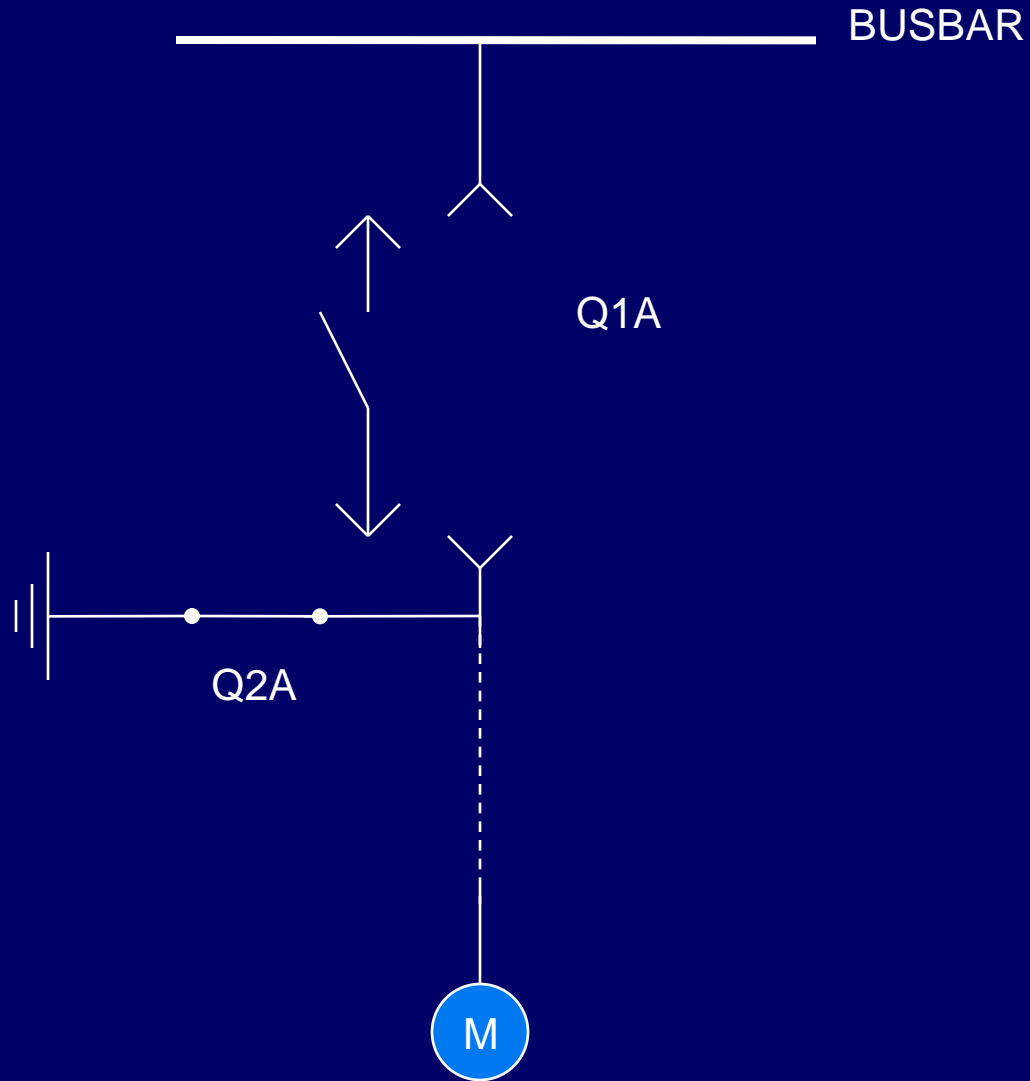
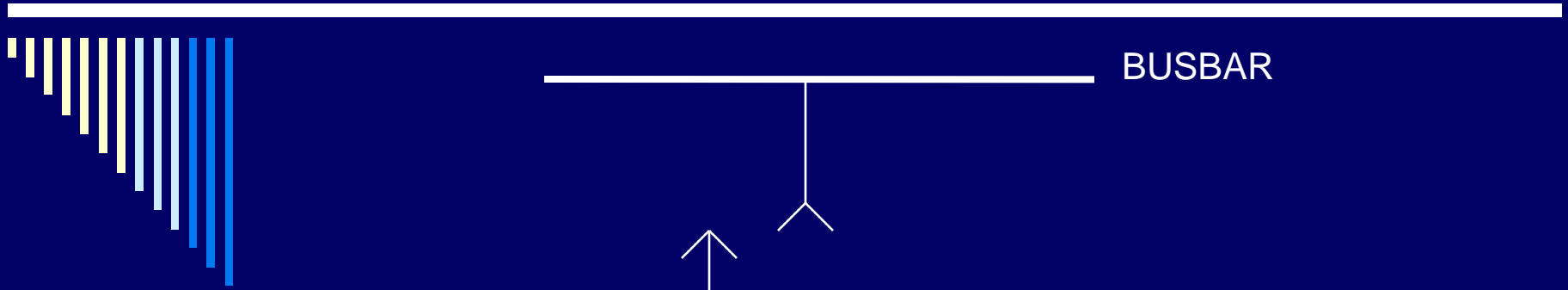
توسط چه کسی انجام میگردد؟

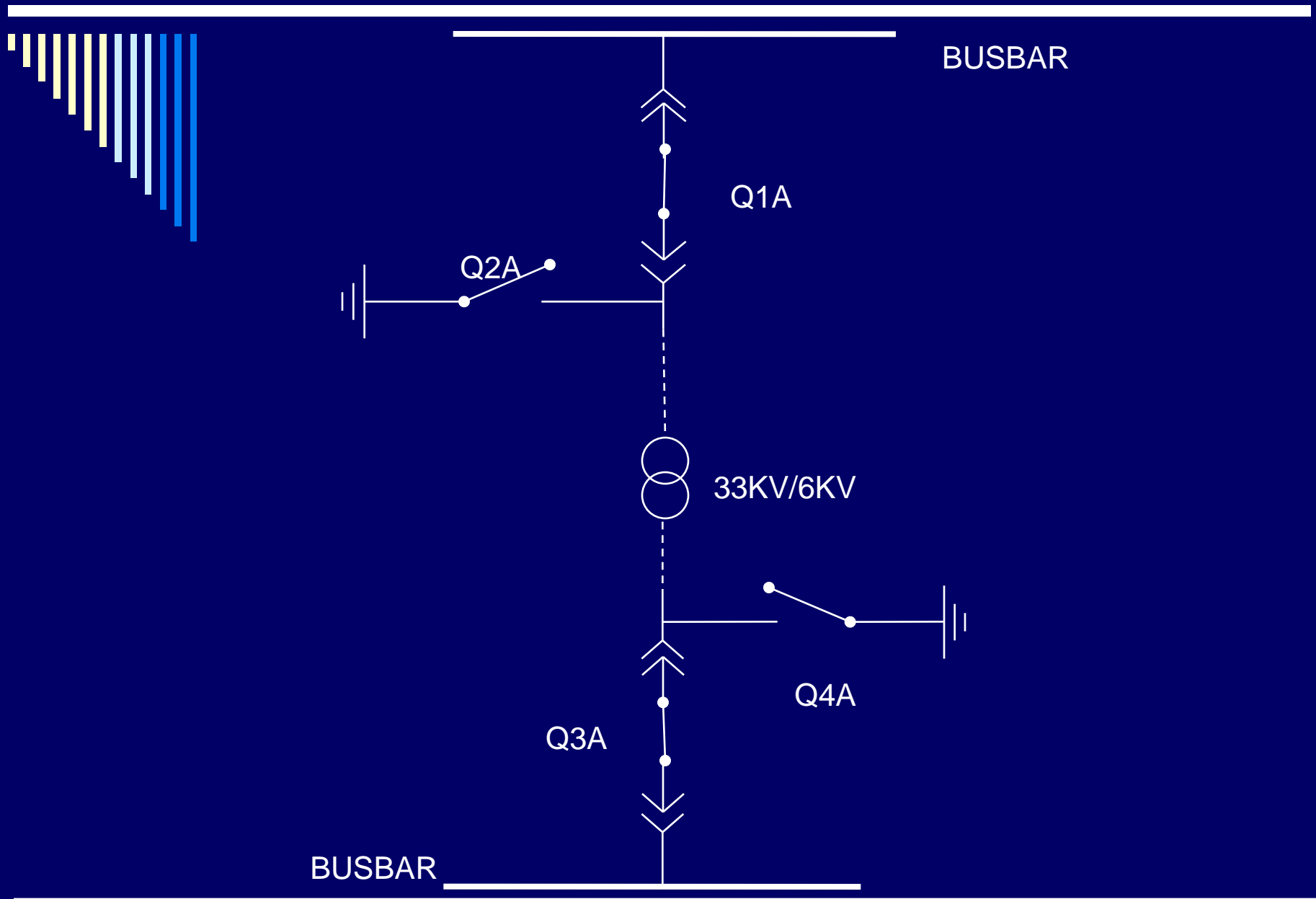
نمای تک خطی

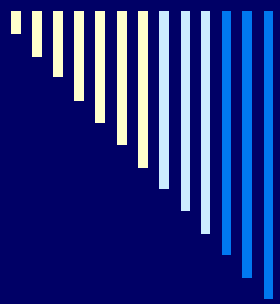
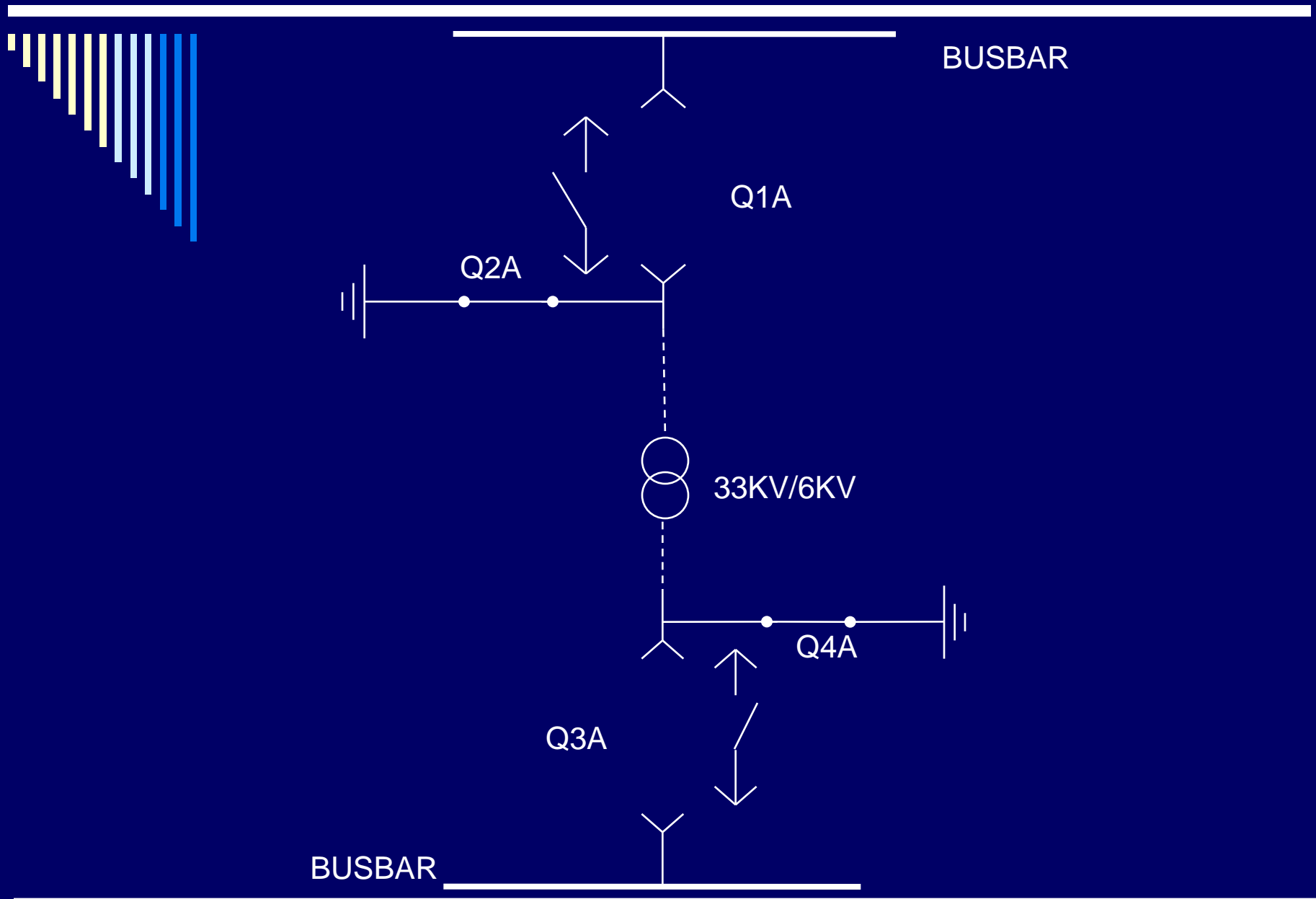


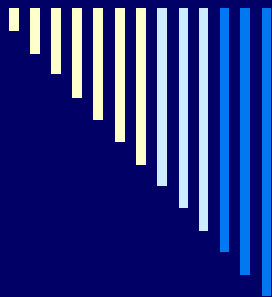
نمای تک خطی

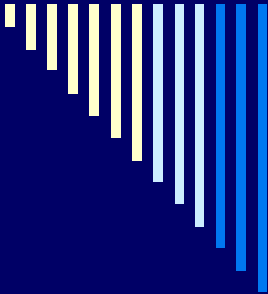


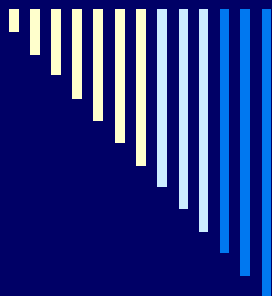












DANGER

ELECTRICAL ISOLATION TAG

Equipment Tag No. _____

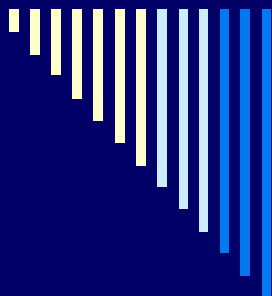
Padlock	
Number	Location

Permit No.

Comp.No.

Signed by:

Date:





DANGER

ELECTRICAL ISOLATION TAG

Equipment Tag No. _____

Padlock	
Number	Location

LTI No. :

Comp.No. :

Signed by:

Change to LTI date:

