

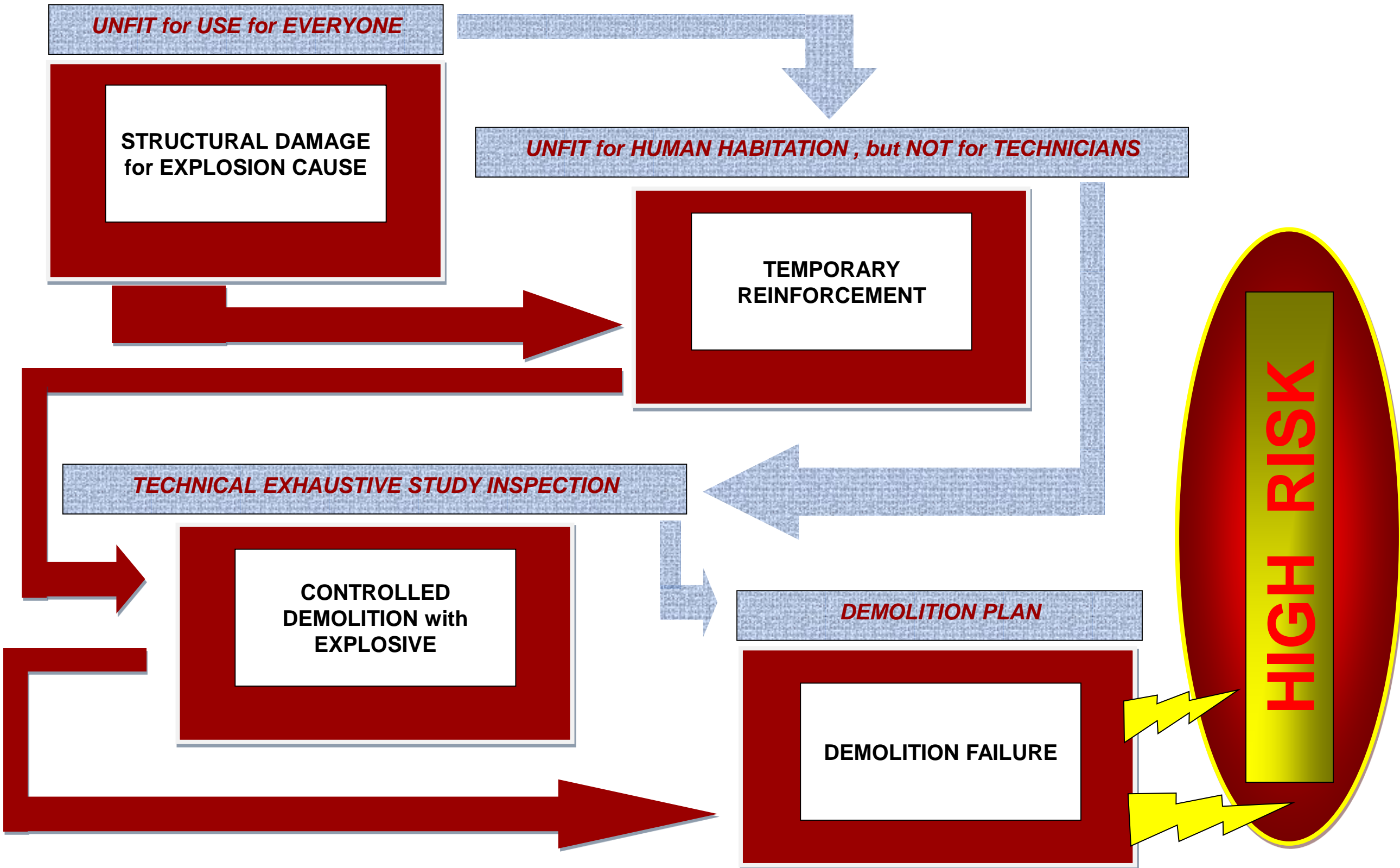


Exposure Factor in a Controlled Demolition

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OVERALL VIEW EXPOSURE and ACTIONS on the STRUCTURES



STRUCTURAL DAMAGE for EXPLOSION CAUSE

**UNFIT for USE for
EVERYONE**

*U.S. and Saudi military personnel survey
the damage to Khobar Towers caused by
the explosion of a fuel truck outside the
northern fence of the facility on King
Abdul Aziz Air Base near Dhahran, Saudi
Arabia*



EXPOSED : 19 dead +
64 hospitalized + **200**
injuries

T_e
**Emergency
Time**

*Explosion Mariahilfer-Straße Wien
26.04.2014,
part of the roof collapsed and windows of
the building in the capital's 15th district
were shattered.*

EXPOSED : 1 dead
+ **5** injuries

STRUCTURAL DAMAGE for EXPLOSION CAUSE

**UNFIT for USE for
EVERYONE –
EMERGENCY**

**110 FIREFIGHTERS AND MANY
PARAMEDICS WERE
CALLED TO THE SCENE**



**T_e
Emergency
Time**

**EXPOSED : 2
firefighters**



**NOT
EXPOSED :
paramedics**

**PARAMEDICS ARRIVED WITH THE
SPECIALIZED “catastrophes unit”
WHICH CONTAINS VEHICLES,
EQUIPMENT AND PERSONAL FOR
LARGE NUMBER OF CASUALTIES**

TEMPORARY REINFORCEMENT



**TECHNICAL INSPECTION for
DETERMINATION of CONFORMITY to
STANDARD HUMAN HABITATION**

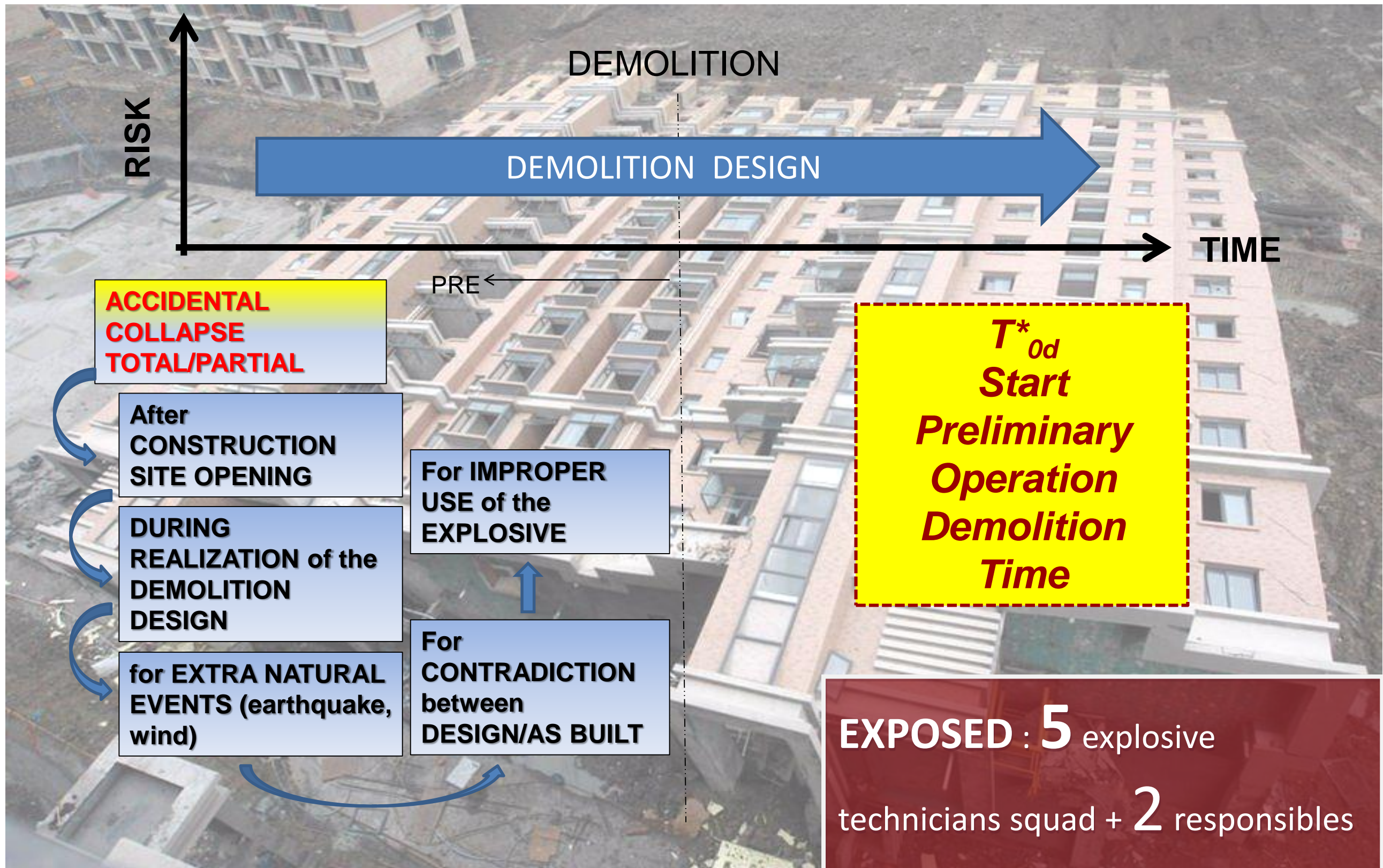


**UNFIT for HUMAN HABITATION ,
but NOT for TECHNICIANS**

**T_e
Emergency
Time**

**T_a
Habitable
Time**

CONTROLLED DEMOLITION with EXPLOSIVE



CONTROLLED DEMOLITION with EXPLOSIVE

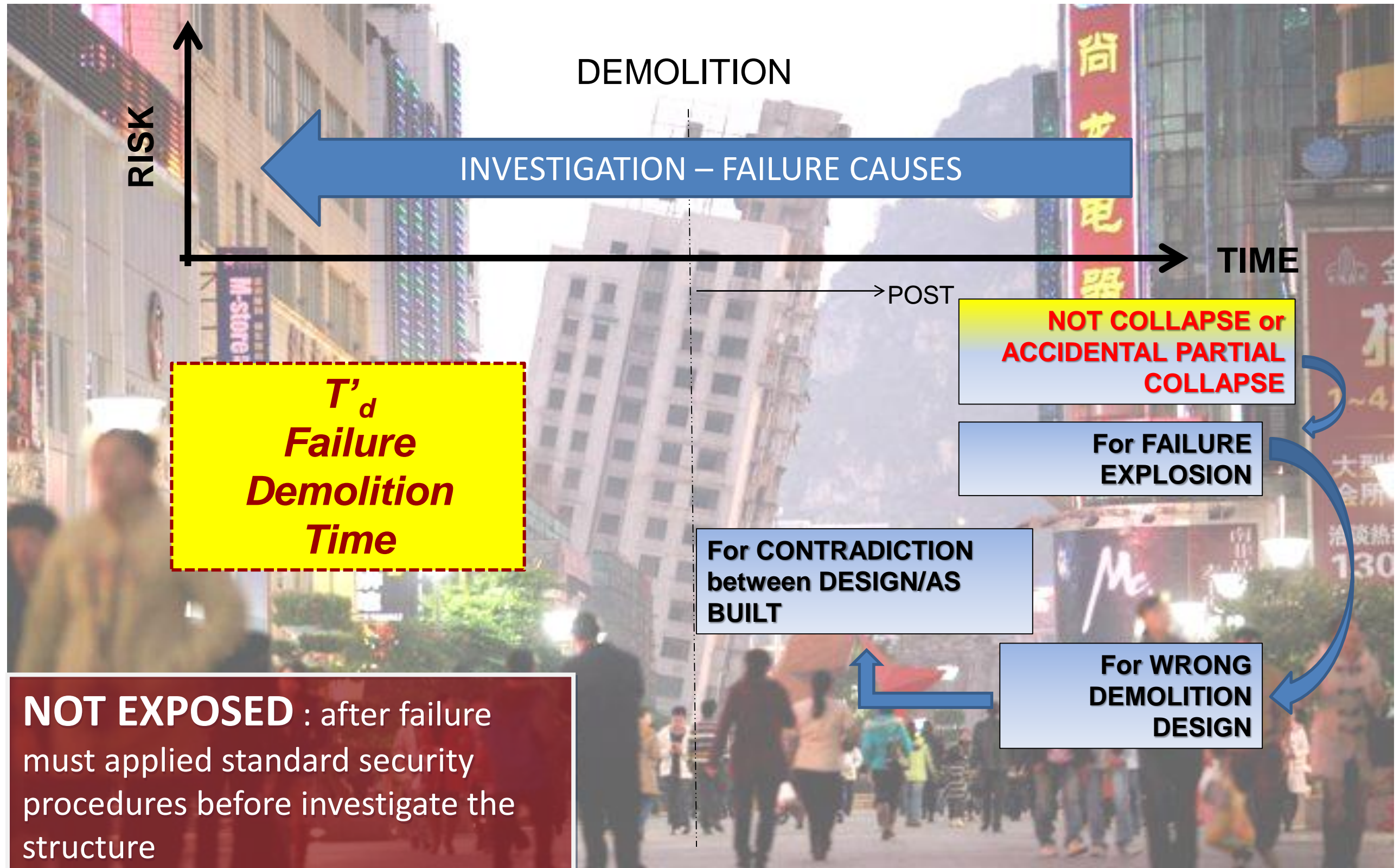
NOT EXPOSED : during the explosion there isn't anyone inside blast security area

T_{0d}
**Start
Demolition
Time**

→ **TIME**



DEMOLITION FAILURE



DEMOLITION FAILURE

**FAILURE
EXPLOSION**

EXPLOSIVE INVESTIGATION:

- NOT CONTROL the QUALITY of EXPLOSIVE MATERIALS
- NOT VERIFY FUSE JOINTS
- NOT EXACT POSITIONING EXPLOSIVE LIKE the DEMOLITION PLANNING

NOT EXPOSED : study phases

NOT EXPOSED : study phases

***T'_d
Start
Investigation
Operation
Time***

**FAILURE
DESIGNER**

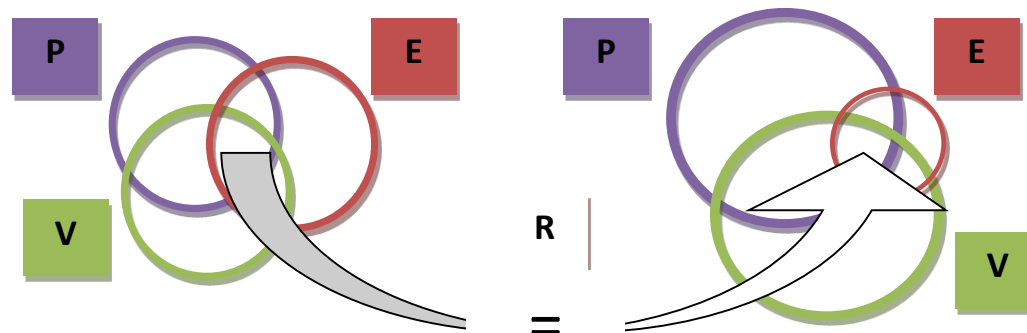
DESIGN ANALYSIS:

- ERRORS in LINES of FIRE DESIGN
- ERRORS in SELECT PROGRAMMING SERIES BLAST DELAYS
- ERRORS in SELECT LOCATION for EXPLOSIVES
- NOT VERIFY the COHERENCE between DESIGN and AS BUILT



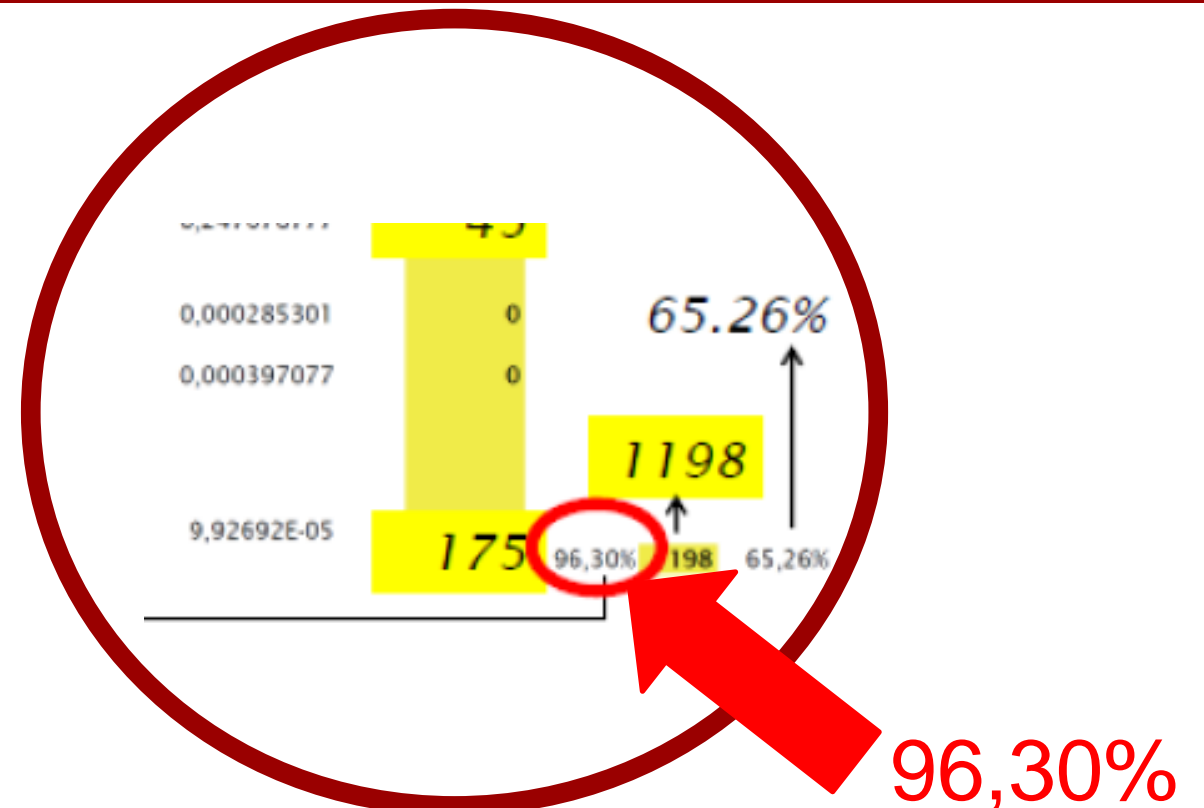
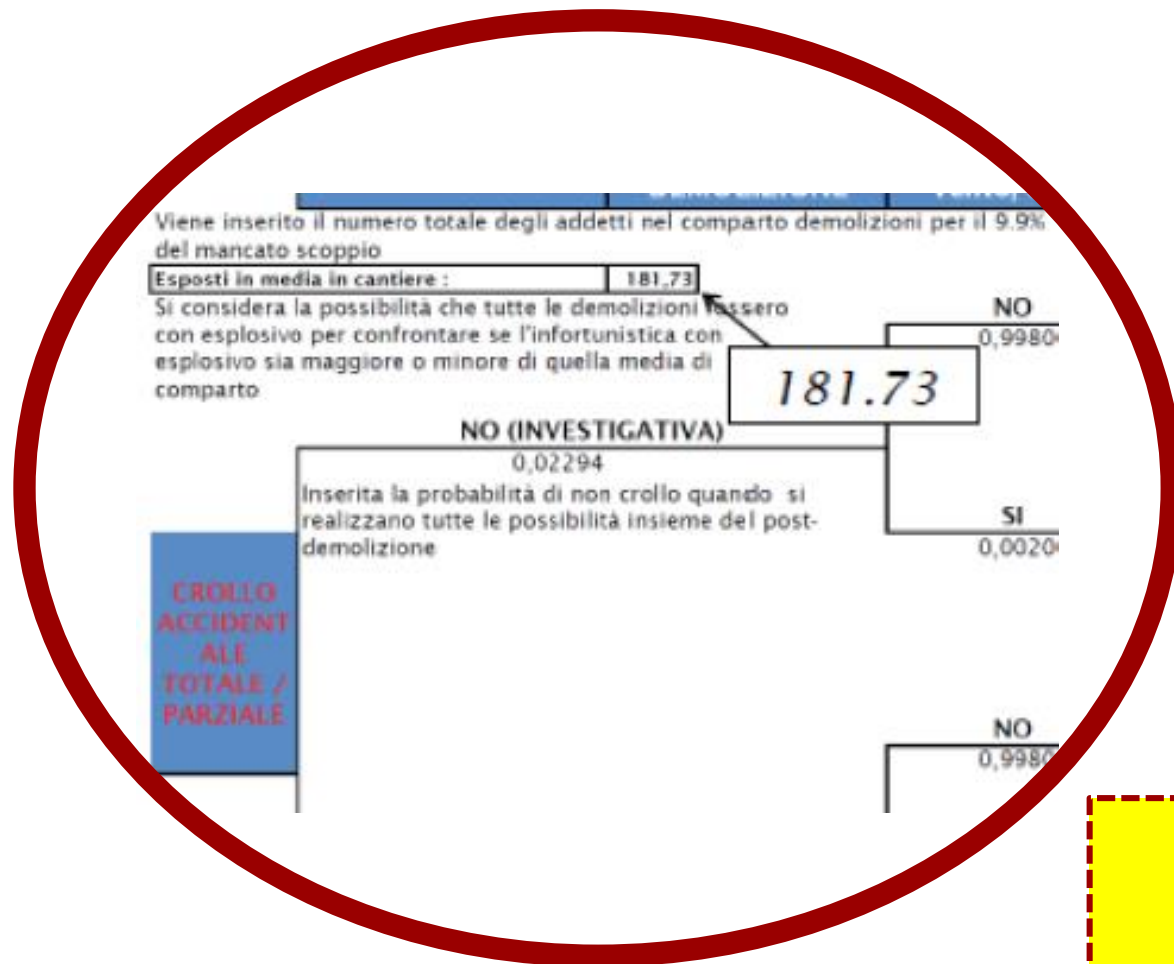
the controlled demolition with explosive is more secure in the demolition sector. But if I've had an not collapse or a partial collapse in place of total demolition like design, it's less secure type of demolition.

**T''_d
Extra Start
Operation
Demolition
Time**



**EXPOSED : 5
explosive technicians
squad + 2 responsables
+ 3 machinists**

REDUCE RISK with EXPOSURE



WHY USE EXPLOSIVE AGAIN?

HAVE A TIME CONSTRAINT?

HAVE A SPACE LIMIT?

**T''_d or T^*_d
Extra
Operation
Demolition
Time**

I choose to induce a blow down with an another type of controlled demolition, and after, in a stable condition, use explosive