

A - 'Seminar' - on - 'Insurance - of - Large
- Infrastructure - Projects' - at -
'Insurance - Institute - of - India', 'BKC,
Mumbai' - '22nd - May - 2015'.

'Importance' - of - 'Risk - Management' -
in - the - 'Infrastructure - Projects'.

A - 'Presentation' - by -

Mr. Abhay Gujar.

'Bajaj - Allianz - General - Insurance - Co. -
Ltd.', Mumbai.

'Risk - Management - Process'.

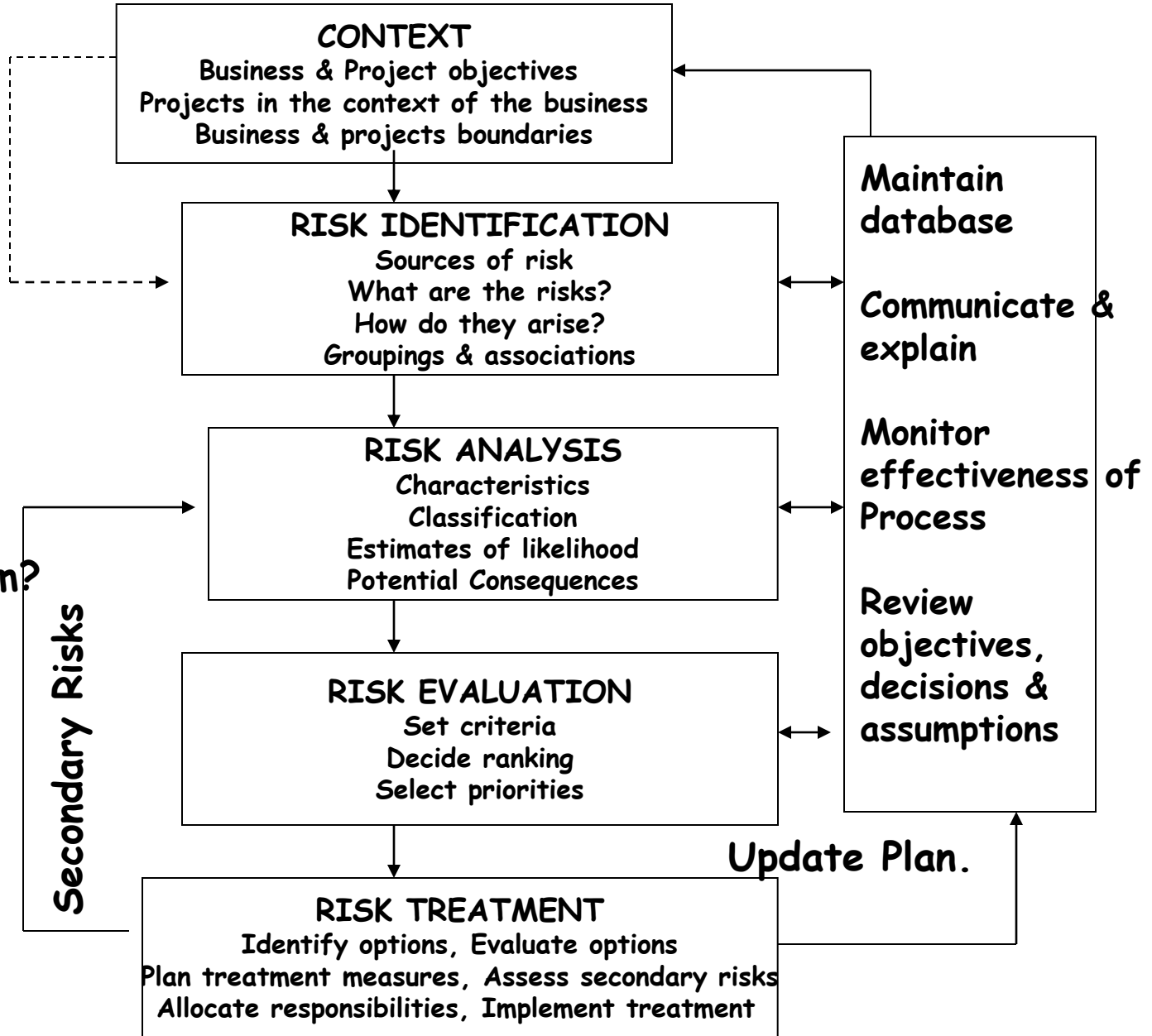
What's at risk - & - why?

What (& where) are the risks?

What is known about them?

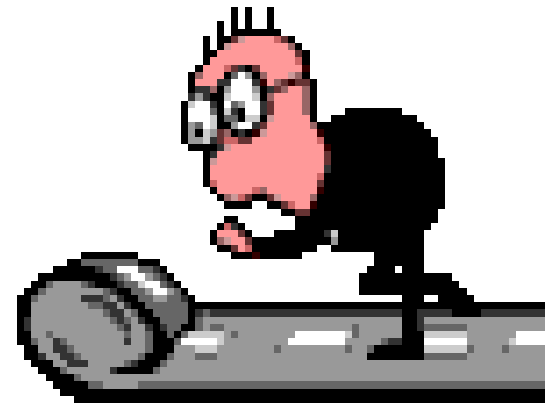
How important are they?

What should be done about them?



'Risk - Management - Process'.

- 'Risk - Identification'.
- 'Risk - Evaluation / Assessment'.
- 'Risk - Control'.
- 'Risk - Avoidance'.
- 'Risk - Reduction'.
- 'Risk - Financing'.
- 'Risk - Retention'.
- 'Risk - Transfer' - & -
- 'Insurance'.



'Frequency - Severity - Matrix'

Severity

Low



High

Frequency

High



Low

High Frequency
Low Severity

High Frequency
High Severity

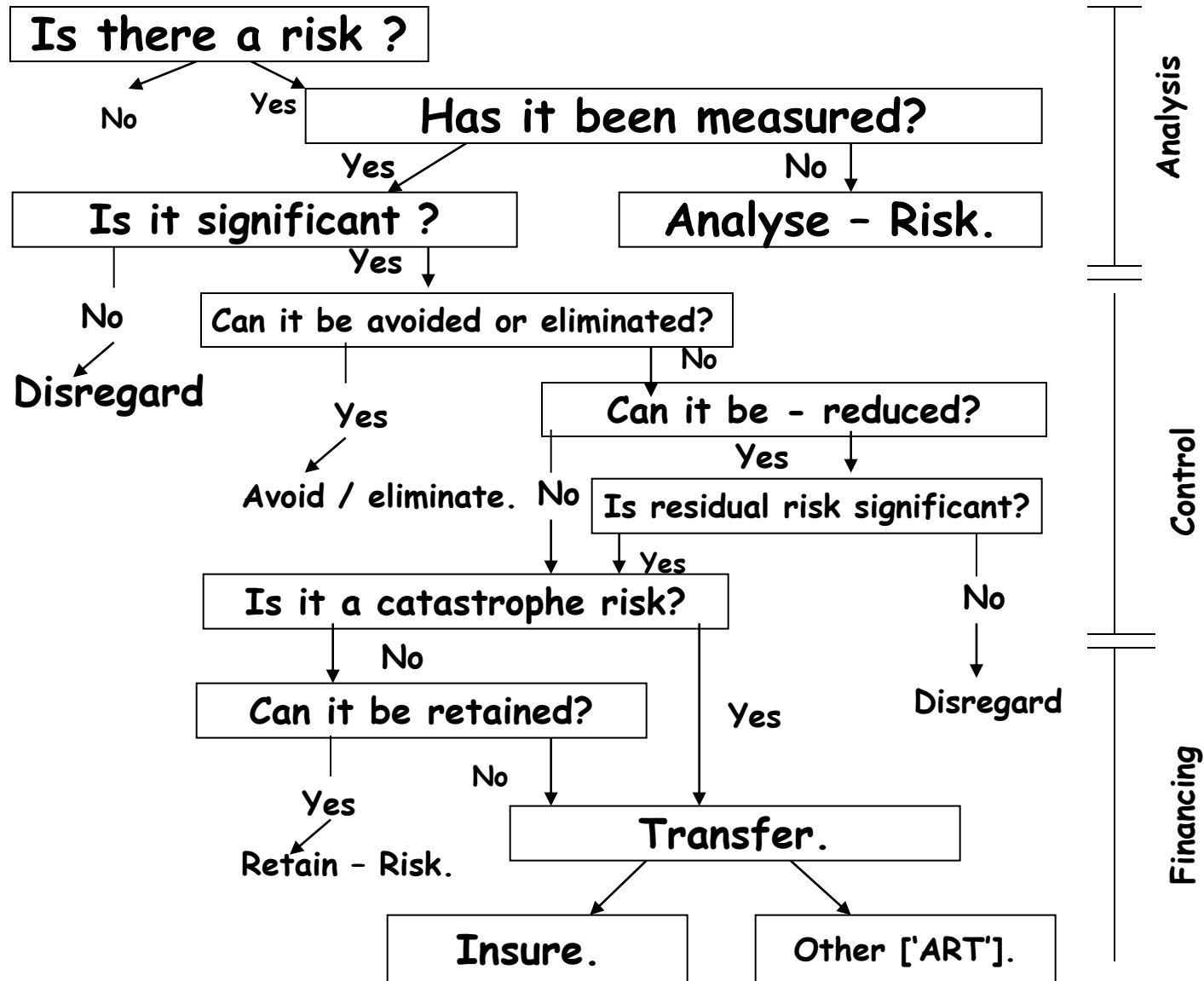
Low Frequency
Low Severity

Low Frequency
High Severity

'Risk - Management - Techniques'.



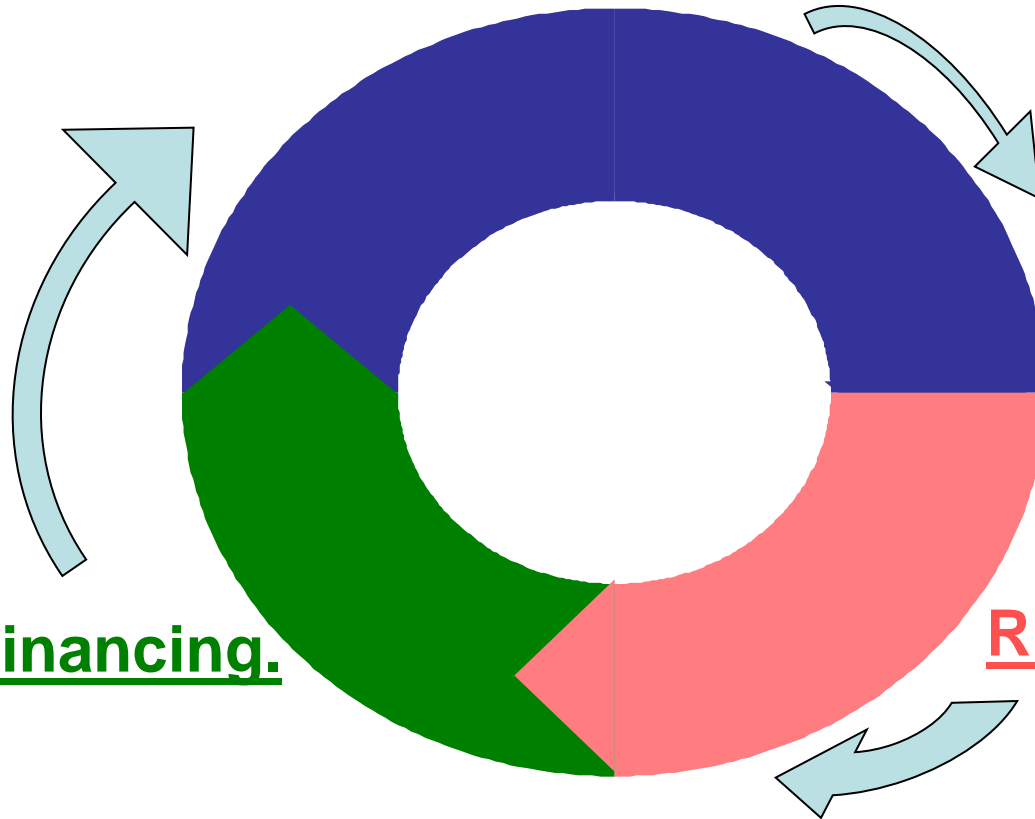
'INTERRELATIONSHIPS - OF - RISK - ANALYSIS, RISK - CONTROL - & - RISK - FINANCING'



'How - to - Derive - Best' - from - 'Risk - Management'.

'Risk - Management - Process'.

Risk - Analysis.



Risk - Financing.

Risk - Control.

It - is - a - 'Continuous' - & - not - a - 'Batch' (only - at - 'Renewal') - Process'.

Why - 'Risk - Management'?



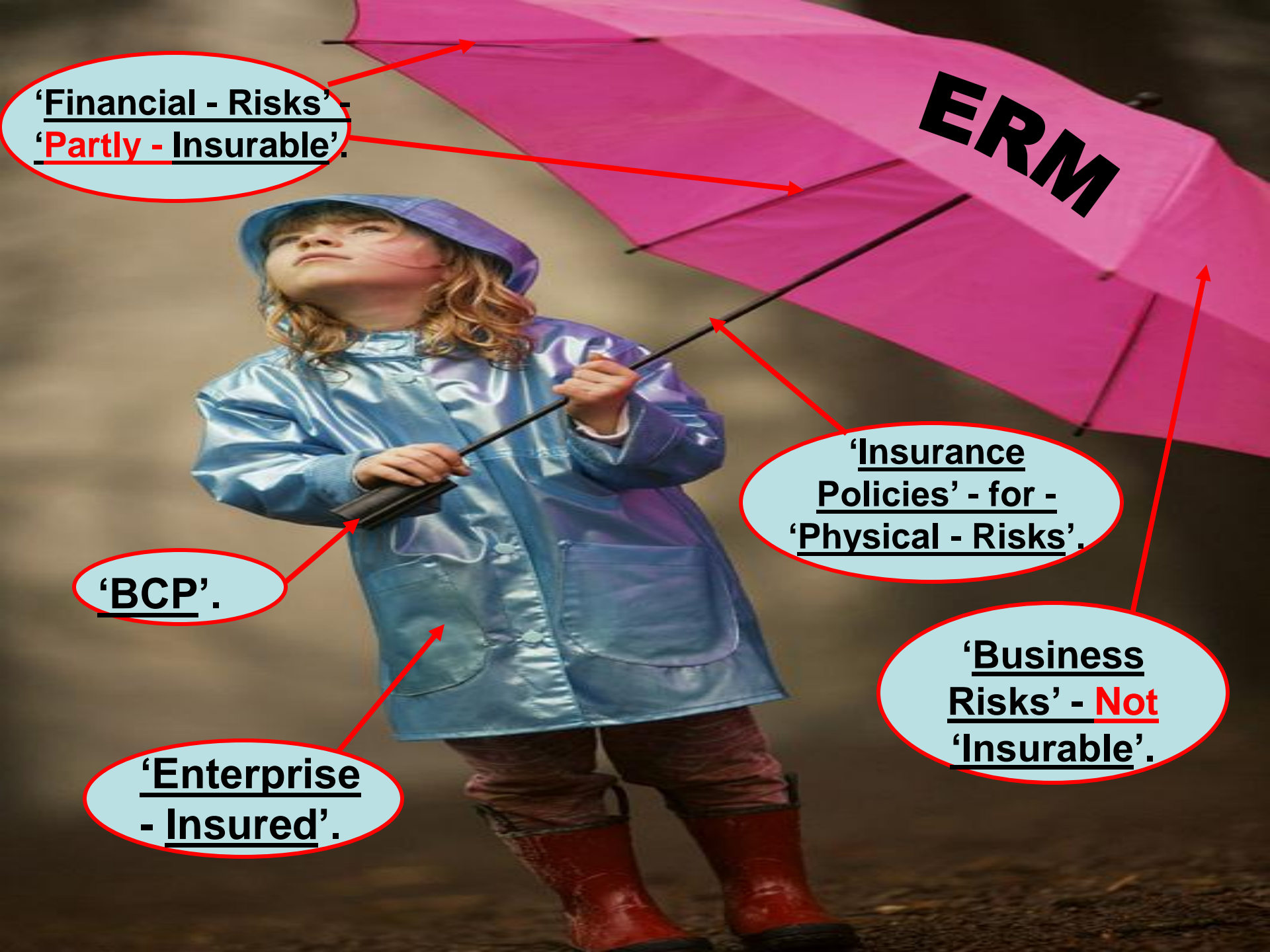
**‘Enterprise - Risk - Management’ -
('ERM').**

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graph TD; A["'Enterprise - Risk - Management' - ('ERM')."] --> B["'Business - Risks'. ('Majority - Not - Insurable')."]; A --> C["'Physical - Risks'. ('Mostly - Insurable')."]; A --> D["'Financial - Risks'. ('Partly - Insurable')."]; B --- C; C --- D; D --- B;
```

‘Business - Risks’.
(‘Majority - Not - Insurable’).

‘Physical - Risks’.
(‘Mostly - Insurable’).

‘Financial - Risks’.
(‘Partly - Insurable’).



'Financial - Risks' -
'Partly - Insurable'.

ERM

'Insurance Policies' - for -
'Physical - Risks'.

'BCP'.

'Business Risks' - **Not**
'Insurable'.

'Enterprise - Insured'.

'BCP - Life - Cycle'.



'Accidents' - pertaining - to -
'Large - Infrastructure -
Projects' - due - to - **'Lack - of
- Application' - of - **'Risk -
Management - Techniques'.****

‘Accident - 1’ : -

**‘Partially - Constructed’ - ‘Hyderabad
- Fly - Over’ - ‘Collapsed’ - onto - the
- ‘Traffic’. ‘30 - Dead’, ‘20 - Injured’.**

‘Busy - Panajagutta - Area’,

‘Sunday - Evening’.

‘Shopping - Time’ - with - ‘Families’.

‘9th - September - 2007’.

'Check' - the - 'Sizes' - of - all - '4 - Supports'. They - keep - 'varying' - in - 'Diameter' - as - well - as - in - the - 'Height'.



'Only - 1 - Support'. That - too - 'Off - Centered'.



The - 'Pillar' - in - the - 'Perspective'. See - the - 'Next - Column', having - '2 - Supports'.



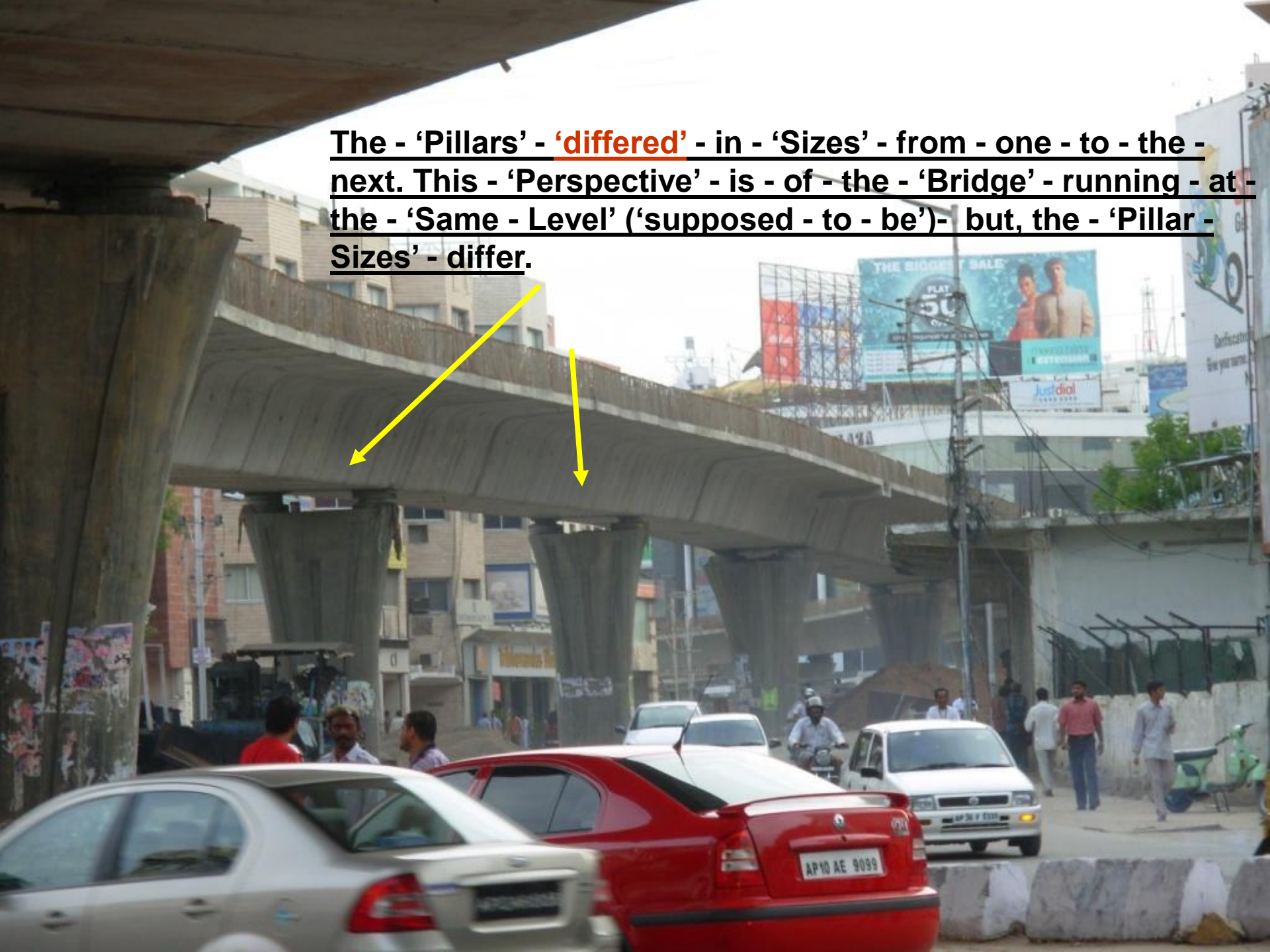
If, the - 'Previous - Support' - was - for - 'Banking',
then, this - 'Pillar' - should - not - have - '2 -
Supports' - of - 'Different - Heights'.



The - 'Concrete - Blocks' - were - **not** - of - the - 'Same - Width'
- through - the - 'Stretch'. The - 'Single - Support - Column' -
under - a - '**Thinner** - Slab'.



The - 'Pillars' - 'differed' - in - 'Sizes' - from - one - to - the - next. This - 'Perspective' - is - of - the - 'Bridge' - running - at - the - 'Same - Level' ('supposed - to - be')- but, the - 'Pillar - Sizes' - differ.





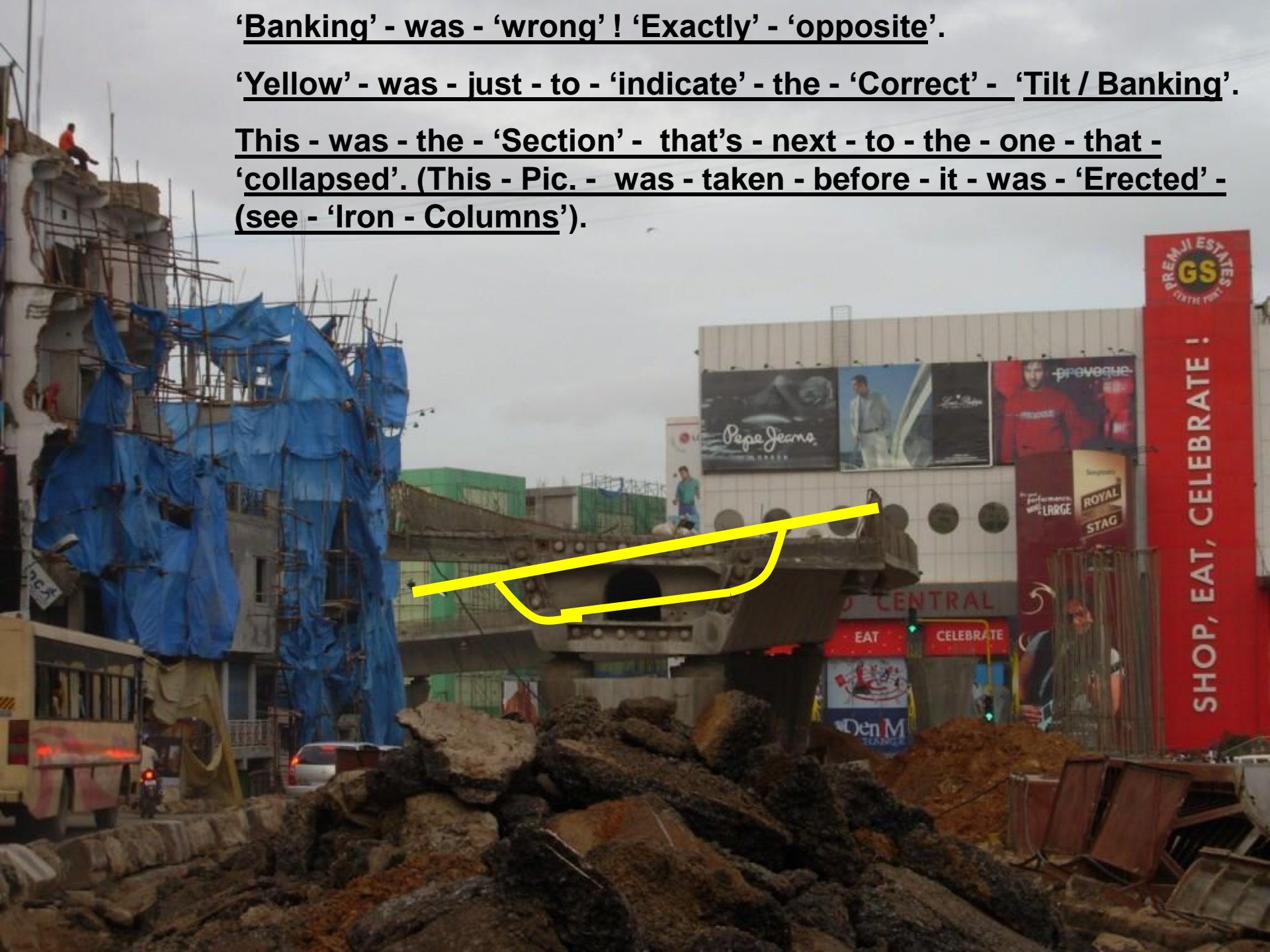
Again - 'Single - Support'.

'Weight - Distribution' - was -
'Questionable'.

'Banking' - was - 'wrong' ! 'Exactly' - 'opposite'.

'Yellow' - was - just - to - 'indicate' - the - 'Correct' - 'Tilt / Banking'.

This - was - the - 'Section' - that's - next - to - the - one - that - 'collapsed'. (This - Pic. - was - taken - before - it - was - 'Erected' - (see - 'Iron - Columns').



'Same' - Section .. Just - 'Closer'.





Pepe Jeans
LONDON

Louis Vuitton

provenge

LG

Seagrams
It's your performance.
With a taste of LARGE
ROYAL STAG

TRIAL

EAT

CELEBRATE

ORANGE
CONCEPT

VELOCITIES

CHEVROLET

APG0DX T/R 12/09



'Exactly' - how - it - was - about - '2 - Months' - back !!!





- The - **Disaster** - occurred - at -
the - **Panjagutta** - Junction', near -
'Nagarjuna - Circle'.

- **2** - **Large - Concrete - Sections** -
Suddenly - **Dropped** - onto -
Oncoming - 'Cars - & - Motorized -
Rickshaws', **Damaging** - **Several** -
Severely .

‘After - Disaster’.















కావ2

హైదరాబాద్









- IT - WAS - NOT - A - 'DISASTER'. - IT - WAS - A - **BLUNDER** - 'CAUSED - BY' - SEVERAL - CONTRACTORS, ENGINEERS, BUILDERS, LABOURERS - & - NEVER - THE - LESS... A - 'CONTRACT - AGENCY'.

- THE - 'GOVERNMENT - OFFICIALS' - WHO - 'SANCTIONED' - THEM - THE - 'CONTRACT' - THE - 'GOVT. - OFFICIALS' - WHO - 'EXAMINED' - THE - 'PROGRESS' - OF - THE - 'FLYOVER' - REGULARLY.

IT - MAY - BE - 'HUMANE' - TO - 'ERR'. BUT, IT - IS - 'IN - HUMAN' - TO - 'IGNORE' - THEM.

'REMEMBER - FRIENDS' - 'ILLEGAL - EXCHANGE' - OF - '1 - RUPEE' - CAN - 'COST' - TOO - MANY - LIVES.

- 'SAVE' - INDIA - ITS - 'OURS' !!!

'Risk - Management - Lessons' - 'Learnt'.

- (1) **'Blunder'** - 'caused - by' - **'Contract - Agency'** - due - to - **'Lack - of - Risks - Awareness'**.
- (2) **'Inadequate - Supervision'**, also - due - to - **'Lack - of - Risks - Awareness'**.
- (3) **'Risk - Ignorance'**. ['Willful', & / or - due - to - **'Corruption'???**].

‘Accidents - 2 - & - 3’.

CAR LOSS

**Delhi Metro Bridge Collapse (Incident 1) and
Mechanical Failure of Crane during Rescue
operation (Incident 2)**

12th and 13th July 2009, New Delhi

'BRIEF - INFORMATION'.

- The - 'Construction' - was - done - under - 'Phase - II - Extension' - of - 'Delhi - Metro' - from - 'Central - Secretariat' - to - 'Badarpur - Border'.
- 'Total - Length' - of - this - 'Stretch' - was - '20.04 - Kms.'
- '15 - Stations' - were - to - be - 'constructed' - on this - 'Line'.
- The - 'Project' - was - likely - to - be - 'completed' - by - 'September - 2010'.
- The - 'Main - Contractor' - for - this - 'Stretch' - was - a - 'Famous - Infrastructure - Company'.
- 'CAR - & - CPM - Policies' - were - taken - from - '2 - Different - Local - Insurers'.
- According - to - 'News - Papers', the - 'Expected - Loss' - was - 'INR - 60 - Millions'. ['Rs. - 6 - Crs.].

'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.

- The - 'Incident' - took - place - on - '12th - July, 2009' - at - '5 - A.M.'
- 'Preliminary - Inquiry' - 'showed' - that - the - 'Accident' - had - 'occurred' - as - a - 'Pier - Cap - got - 'displaced'.
- The - 'Pier - Cap' - on - 'Top' - of - the - 'Pillar' - gives - 'support', both - to - the - 'Launcher' - & - the - 'Segment'.
- The - 'Launcher' - is - 'used' - for - 'erecting' - the - 'Segment'.
- Around - '30 - Persons' - were - 'working' - at - the - 'Site', out - of - which, '6 - Persons - Died' - & - '15 - were - Injured'.
- 'Delhi - Police', 'Fire - Brigade', 'Disaster - Management - Team' - all - 'rushed' - to - the - 'Site', soon - after - 'Call' - of - the - 'Collapse' - came - at - '5 - A.M.'
- The - 'Injured - People' - were - 'rushed' - to - the - nearby - 'Hospitals' - for - 'Treatment'.

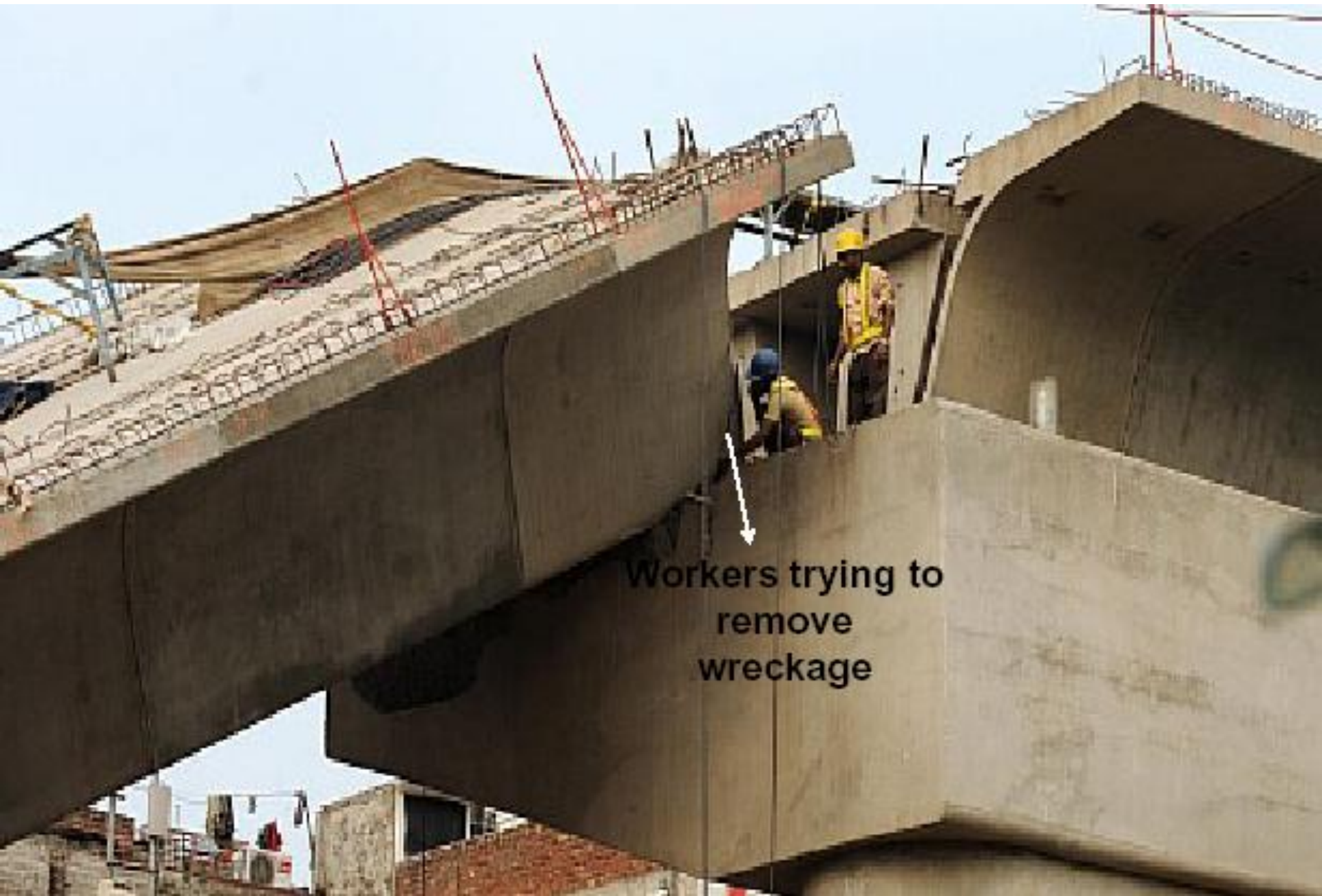
'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.



'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.



'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.



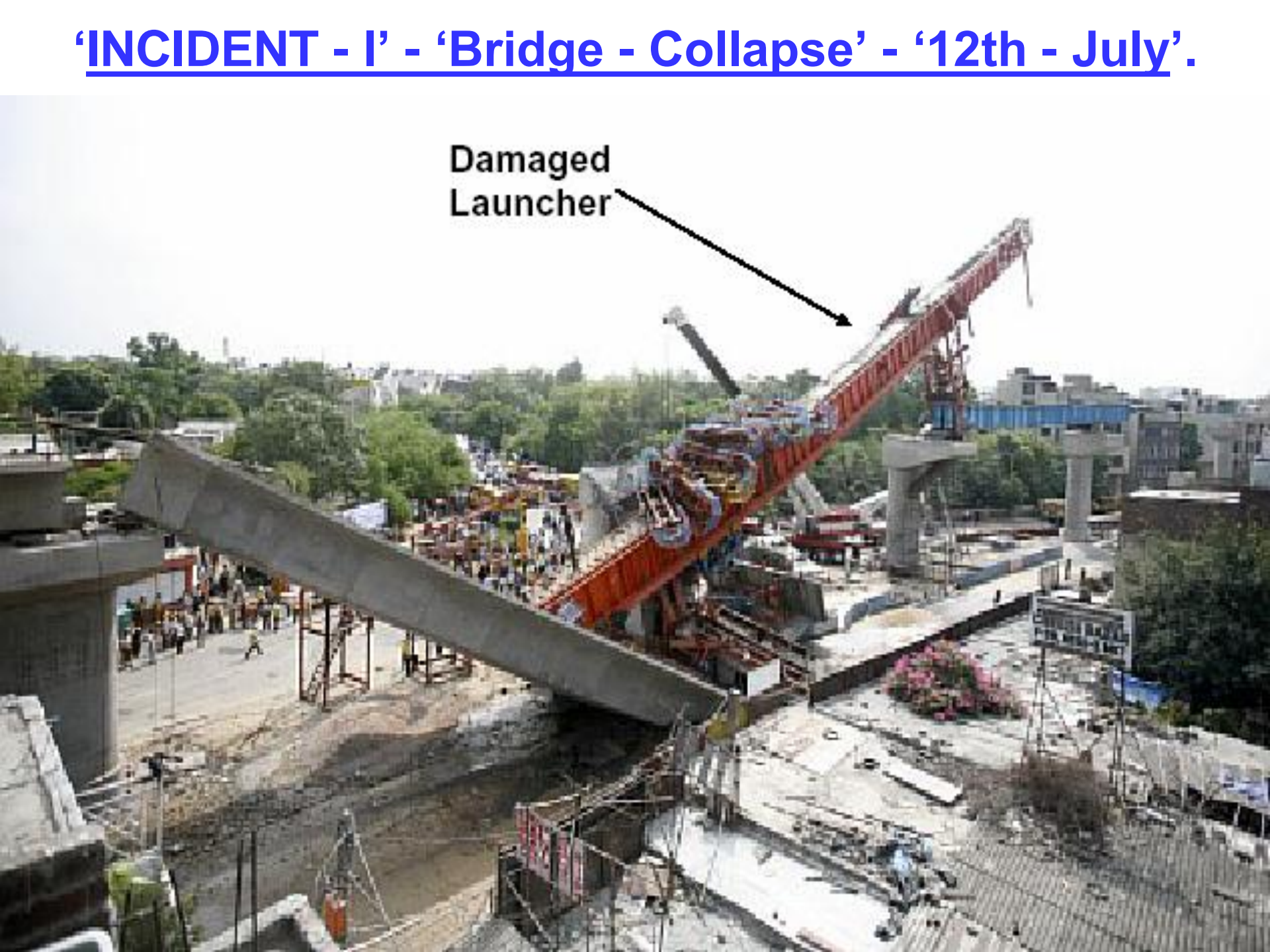
Workers trying to
remove
wreckage

'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.



'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.

Damaged
Launcher



'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.

Crane trying to remove debris



'INCIDENT - I' - 'Bridge - Collapse' - '12th - July'.



Body of a worker
trapped under debris

'Court - Notice' - to - 'Gammon - India' - for - 'Delhi - Metro - Accident'.

- 'Fri, Jul - 24, 2009'; '05:36 - P.M.'
- **'Delhi - High - Court'** - on - 'Friday', 'issued' - a - 'Notice' - to - **'Gammon - India - Limited'**, the - 'Contractor' - for - 'building' - an - 'Elevated - Section' - of - 'Delhi - Metro' - that - 'collapsed' - earlier - this - 'Month', **'killing' - '6 - People'**.
- 'Hearing' - a - 'Petition' - from - the - 'Families' - of - '4' - of - the - 'Victims' - of - the - 'July - 12 - Mishap', seeking - 'Compensation', Justice - Ms. Rewa Khetrapal - 'directed' - the - 'Company' - to - 'File' - its - 'Response' - by - 'Aug. - 20' - when, the - 'Matter' - will - be - taken - up - for - 'Further - Hearing'.
- The - 'Petitioners' - 'pleaded' - 'before' - the - 'Court' - that - the - 'Families' - of - each - of - the - **'Deceased'** - should - get - 'Compensation' - of - **'Rs. - 5 - Million'** - while, the - **'Injured'** - should - be - given - **'Rs. - 2.5 - Million'** - each.
- 'Estimated - Aggregate - Compensation': - **'Rs. - 6.75 - Crs.'**

‘Court - Notice’ - to - ‘Gammon - India’ - for - ‘Delhi - Metro - Accident’...contd..

- The - ‘Petition’ - was - ‘filed’ - by - the - **‘Shramik - Referral - Centre’**, an - **‘NGO’** - working - on - behalf - of - the - ‘Victims’.
- The - ‘Petition’ - ‘noted’ - that - the - ‘Value’ - of - a - Labourer's - ‘Life’ - should - not - be - ‘accounted’ - on - the - ‘Basis’ - of - his - ‘Socio - Economic - Status’ - but, it - should - be - on - par - with - any - other - ‘Professionals’.
- ‘6 - People’, ‘including’ - an - ‘Engineer’, were - ‘killed’ - & - over - a - ‘Dozen’ - were - ‘injured’ - when, an - ‘Under - Construction’ - ‘Elevated - Section’ - of - ‘Metro - Tracks’ - **‘collapsed’** - in - ‘Zamrudpur’ - of - ‘South - Delhi’.

'INCIDENT - II' - 'Crane - Accident' - '13th - July'.

- The - 'Incident' - took - place - on - '13th - July', at - '11:39 - A.M.' - at - the - 'Same - Site' - where - 'Bridge' - had - 'Collapsed'.
- Due - to - 'Mechanical - Failure', the - 'Boom' - of - the - '1st - Crane' - developed - 'cracks' - & - 'snapped'. (There - were - 4 - 'Cranes', working - 'together' - at - that - time).
- This - put - 'additional - weight / pressure' - on - the - 'Remaining - Cranes'.
- Within - 'Seconds', 'Boom' - of - '2nd - Crane' - 'Snapped'.
- 'Boom' - of - '3rd - Crane' - did - not - 'Snap', but - the - 'Crane' - 'Toppled'.
- 'Nothing' - happened - to - the - '4th - crane'.
- The - 'Launcher' - then - 'fell' - on - some - 'Shops' - on - the - 'Other - Side'.
- The - 'whole' - 'Incident' - 'happened' - in - merely - '3 - Seconds'.

'INCIDENT - II' - 'Crane - Accident' - '13th - July'.

- 'Load - Bearing - Capacity' - of -
'Cranes - 1 - & - 2' - was - '250 - T', of
- 'Crane - 3' - was - '350 - T' - & - of -
'Crane - 4' - was - '400 - T'.
- 'Weight' - of - the - 'Launcher' - was -
'260 - T'.
- '5 - People', were - 'injured' - in - the -
'Incident'.

'INCIDENT - II' - 'Crane - Accident' - '13th - July'.



Damaged Cranes

Damaged Launcher

'INCIDENT - II' - 'Crane - Accident' - '13th - July'.



'FINDINGS'

- The - 'Project' - was - **'delayed'** - by - 'almost' - '2 - Months'.
- As - per - 'Local - Residents' - in - the - 'Surrounding - Area', **'Cracks' - were - 'visible'** - in - the - 'Pillar' - that - **'collapsed'** - & - the - **'Work'** - had - been - **'stopped'** - for - about - **'2 - Months'** - to - **'repair'** - it.
- The - 'Phase - 2 - Project' - was - 'sanctioned' - in - '2005', 'consisting - of' - '121 - Km. - Line' - & - '81 - Metro - Stations' - & - 'Time - Limit' - for - 'completion' - was - 'October - 2010'.
- 'Phase - I' - 'started' - on - '1st - October, 1998' - & - was - 'completed' - in - 'November, 2006'.
- **'Total - Length'** - of - 'Project' - was - **'65 - Kms.'**

FINDINGS...CONTD...

- 'Total - Time - Limit' - for - 'Phase - 1' - was - '8 - Years', while - that - for - 'Phase - 2' - was - '5 - Years', while - the - 'Length' - of - the - 'Project' - was - almost - 'double'.
- Because - of - 'Short' - 'Time - Limit', 'Work' - was - being - on - **Fast - Pace**.
- According - to - 'Experts', because - of - 'Short - Time - Limit', some - **Compromises** - were - 'done' - with - the - 'Construction - Work' - & - 'Safety - Norms'.
- Also, the - 'Performance' - of - the - 'Contractor' - was - under - 'Scrutiny'.
- As - per - 'Terms - & - Conditions' - of - 'Contract', **Heavy - Fines** - would - be - 'imposed' - on - 'Contractor' - if, the - 'Project' - got - 'Delayed'.
- Hence, in - the - **Hurry - of - Completion** - of - 'Project' - on - 'Time', which - was - already - 'delayed', the - Contractor - 'ignored' - the - 'Safety - Norms', which - 'resulted' - in - the - **Accident**.

'FINDINGS'CONTD...

- Also, according - to - 'Professors' - of - 'Indian - Institute - of - Technology, Delhi', the - 'Load' - was - not - 'Distributed' - 'Properly' - on - the - 'Cranes', that - 'resulted' - in - 'Accident' - on - 'Next - Day' - of - 'Bridge - Collapse'.

'Risk - Management - Lessons' - 'Learnt'.

(1) **'Time - Pressure'** - to - **'avoid'** -
'Delays' - & - **'mainly'** - the -
Corresponding - **'Penalties'**.

(2) **'Compromises'** - were - therefore -
'required' - with - the - **'Construction -
Work'** - & - **'Safety - Norms'**.

(3) Was - there - any - **'Involvement'** -
of - a - **'Risk - Manager'** - by - the -
'Principle / Contractor'? - **'Doubtful'**.

‘Accidents - 4 - & - 5’.

C
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CAR LOSS

CHIMNEY COLLAPSE

India 2009

‘BRIEF - INFORMATION’.

- ‘Date’ : ‘23rd - Sept. - 2009’.
- ‘Type - of - Risk’. : ‘Power - Plant - Construction’.
- ‘Type - of - Loss’. : ‘Collapse’.
- ‘Type - of - Cover’. : ‘CAR’.
- ‘Estimated - Loss’. : ‘Not - Available’.
- ‘Description - of - Loss’ : ‘Collapse’ - of - ‘Chimney’ - under - ‘Construction’.
- ‘Probable - Cause - of - Loss’ : ‘Technical - Fault’ - in - ‘Construction’.

'TECHNICAL - INFORMATION' - OF - 'CHIMNEY'.

- 'Total - Chimney - Height'.
: - '200 - Mtrs.'
- 'Diameter' : - ~ '14 - Mtrs'.
(at - 'Ground - Level').
- 'Point - of - Failure': - '174 - Mtrs.'.
- 'Dia'. - at - 'Failure - Point'
: - ~ '9 - Mtrs.'



'INCIDENT'.

- '3.45 p.m.' : - Heavy - 'Thunder - Storm' - with - 'Rain'.
- '3.50 p.m.' : - 'Collapse - of - Chimney'. It - was - a - 'Straight - Collapse' - like - 'WTC - Tower' (9/11). '50' - feared - to - be - 'killed'.
- '4:10 p.m.' : - 'Rains' - 'stopped'.
- '4:30 p.m.' : - 'Rescue - Team' - 'rushed' - to - the - 'Spot'. 'Initial - Casualties' - 'identified' - & - 'rushed' - to - 'Hospital'.
- 'Next - 48 - Hrs.' : - 'Rescue - Operations' ... continued.

'COLLAPSED - CHIMNEY - STRUCTURE'.



'RESCUE - WORK' - IN - 'PROGRESS'.



'CONCRETE - DEBRIS'



Heap of Concrete debris

~ 5 to 6 mtr

'DEBRIS - REMOVAL'.

**Equipments
in rescue operation**



'DEBRIS - REMOVAL'..CONTD.



'DEBRIS - REMOVAL' ..CONTD.



‘Boiler - Chimney - Collapse’ - at - ‘Paricha - Thermal - Station’.

- ‘Location’ : - ‘2 x 250 - MW’ - ‘Thermal - Power - Plant’, Paricha, Jhansi, U.P.
- ‘Date - of - Loss’ : - ‘24th - May - 2010’ - in - ‘Noon’. [‘Workers’ - resting - after - ‘Lunch’]
- ‘Commissioning’ : - Was - ‘Scheduled’ - in - the - ‘First - Week’ - of - ‘June - 2010’.
- ‘Chimney - Height’ : - ‘175 - M’.
- ‘Contractor’ : - ‘National - Building - Construction - Corporation’. [‘NBCC’].

'Boiler - Chimney - Collapse' - at - 'Paricha - Thermal - Station'.

- **'4 - Killed', '50 - Trapped'** - under - **'Debris'**.
- **'Army' + 'Gas - Cutters' + 'Earth - Movers'** - for - **'Debris - Removal'**.
- **'Chimney' - was - 'slightly' - 'Lop - Sided' - [with - 'one - side' - 'lower' - or - 'smaller' - than - the - other] - 'requiring' - **'Rectification'**.**
- **'Heavy - Thunderstorm' / 'High - Speed - Winds'** - in - the - **'Night'** - before - the - **'Mishap'**.
- **'DSU'?** - Certainly - **'Yes'**.

'Boiler - Chimney - Collapse' - at - 'Paricha - Thermal - Power - Station'.
['24th - May - 2010'].



'Risk - Management - Lessons' - 'Learnt'.

- **'Structures' - under - 'Construction' - are - 'weaker' - than - the - 'Completed - Structures'.**
- Therefore, 'reasonably - high - speed - winds', with - 'rains - & - thunders' - were - 'sufficient' - to - 'trigger' - a - 'Collapse'.
- **'Lack - of - Anticipation' - of - 'Such - Disasters'.**
- **'Unawareness' - about - 'Disaster - Recovery' - & - 'Disaster - Management - Plans'.**
- **'Out - of - Proportion' - 'Debris - Removal' - related - 'Work - & - Expenses' + 'Associated - Delays'.**
- **The - 'Site' - was - not - 'accessible' - due - to - the - 'Pending - Inquiry' - pertaining - to - 'Large - Nos. - of - Fatalities'.**

‘Accident - 6’.

'Flooded - Dubai - Construction - Site'.

- 'Photographs' - 'show' - a - 'Construction - Site' - in - 'Dubai' - being - 'inundated' - by - 'Water' - from - an - 'Adjacent - Marina' - after - a - 'Holding - Wall' - 'gave - way'.
- The - 'Accident' - 'occurred' - at - the - 'Site' - of - the - 'Infinity - Tower - Project' - in - 'Dubai, UAE' - in - 'February - 2007'.
- This - 'Sequence - of - Photographs' - 'showed' - the - 'Sudden' - & - 'Rapid' - 'Flooding' - of - a - 'Large - Construction - Site'.

Subcontractors & Suppliers
Phone: 354 3007



Orbit Construction Update
June 30th - 2007





2007 2 1





‘Accident - 7’.

**‘Collapse’ - of - a - ‘Road -
Bridge’ - in - ‘Korea’.**

‘Damage - Photographs’.







40

TRAFFIC



1792

限高 4.5m
限重 10t
40

22-6 22-6



シマノ創業

特別許可







'Accident - 8'.

To - 'attend' - 'Collapsed -
Scaffolding - Structure' - during -
the - 'Beam - Erection' - or - to -
'rescue' - the - '7 - Site - Workers'
- luckily - 'wearing' - 'Safety -
Belts'?























HYUNDAI















(9) . ‘Erection - Gantry’ - for - ‘Elevated - Guideway - Segments’ - at - ‘Vancouver’ - working - ‘Directly’ - above - a - ‘Live - Highway’ - ‘created’ - ‘Significant’ - ‘Liability - Risk - Exposure’.



