At this point the immobiliser circuit will also start rapidly pulsing for 40 seconds, completely disabling the engine and eventually bringing the vehicle to a stop. If the thief switches the ignition to the *off* position and back to the *on* position again, the horn will restart and operate constantly and the hazard lights will flash for 60 seconds.

The immobiliser circuit will close for 15 seconds and will rapidly pulse for 15 seconds before re-opening the circuit, allowing the vehicle to be driven to a safe location before once again being immobilised. The hazard lights will continue to flash, and on every subsequent attempt to start the vehicle will cause the horn to operate for 30 seconds, but the immobilizer circuit will not open, so the vehicle will not start and the hazard lights will keep flashing until the vehicle's battery is drained or the system is disarmed.

4.15 Hong Kong mourns victims of bus hijacking in the Philippines

Manila, Philippines (CNN) — As the bodies of eight tourists killed in a bus hijacking in the Philippines arrived in Hong Kong, China, on Wednesday, the Hong Kong government urged citizens not to take their grief and anger out on Filipinos despite "the poor way" the hijacking was handled by authorities.

The Cathay Pacific flight, which also carried eight survivors and 19 relatives as well as dozens of officials, was greeted by a large crowd on its arrival at Hong Kong International Airport. In a somber ceremony, bagpipers played "Amazing Grace" as coffins were carried from the plane and wreaths laid upon them.

Several people were helped down a flight of stairs from the plane; one man's hand and arm were bandaged. Chief Secretary Henry Tang received the arrivals and then told reporters his government would urge its Philippine counterpart to conduct an "comprehensive, thorough, and impartial" investigation.

"The truth is the best consolation for the victims and their families," he said.

He added that Hong Kong is prepared to aid the Philippine authorities during the investigation.

"In order to facilitate a fair and thorough understanding of the incident, we believe it is imperative that the investigation report should at least cover a detailed account of the whole incident; and a detailed account of the causes of death and injuries," he said.

Two of three remaining hospitalized victims had been expected to be released from Philippine hospitals in time for the flight, but it was not known if they were on the plane that landed in Hong Kong. A third, more seriously injured tourist, remained in an intensive care unit in the Philippines.

Hong Kong's Chief Executive, Donald Tsang, was to lead a ceremony to raise the flag and lower it to half-staff on Thursday, and a three-minute period of silence was scheduled for 8 a.m., according to the Hong Kong government. Citizens were urged to join the ceremony or pay tribute in other ways during that time.

Meanwhile, residents in the Philippines observed a national day of mourning Wednesday in the aftermath of this week's bus hijacking in Manila.

Hong Kong's Equal Opportunities Commission said in a statement it "understands the strong feelings of Hong Kong people on the poor way that the crisis had been handled by the Philippine authorities."

"The EOC urges all members of the community to stay calm and, in line with our good tradition of tolerance and understanding, refrain from shifting our anger towards an innocent group, particularly the Filipinos who are living and traveling in Hong Kong," the statement said. "The people of Hong Kong have every reason to take pride in the racial harmony of this city, and we should guard against any action that may cause racial hatred or discord."

Former police officer Rolando Mendoza, who was apparently upset about having lost his job, took hostage a busload of tourists from Hong Kong on Monday. Witnesses said Mendoza was initially willing to cooperate, but he was shot dead by police after authorities say he became violent and started shooting hostages.

Rodolfo Matibay, district director of Manila police, took responsibility for how the incident was handled, saying he ordered the police assault on the bus, according to Gen. Leocaldo Santiago, regional director of Manila police.

He has been placed on administrative leave while the case is being investigated.

Four men and four women were killed in the standoff. One passenger was critically wounded and six others were hospitalized with less serious injuries.

The gunman had previously released nine of the hostages, including a mother and her three children, a man with diabetes and two photographers. The bus driver escaped.

Santiago said police killed none of the hostages, though a ballistics investigation has yet to be completed. Philippine President Benigno Aquino ordered all flags at public institutions in the Philippines, its embassies and consulates around the world lowered to half-staff.

In Hong Kong, flags also were lowered and traders at the Hong Kong Stock Exchange paused in silence.

The Chinese territory, meanwhile, issued a black travel alert for the Philippines, advising residents to avoid all travel there.

The government's Home Affairs Department has set up 18 condolence points around Hong Kong to allow people to mourn the victims and offer messages of sympathy. Tsang made an appearance at one of them on Tuesday to observe a minute of silence.

A Facebook page also honors the victims.

At the Hong Kong Management Association David Li Kwok Po College, students and faculty remembered Jessie Leung, 14,' who was killed along with her father and sister. Her brother remains in critical condition; her mother also survived the incident.

"Jessie was a helpful girl — cheerful, lovely, a good academic," said Catherine Chan, the school's development manager. "We hope her brother will recover soon."

In Manila, a makeshift shrine was erected in front of the bus, with flowers left for the victims.

The deadly standoff unfolded live on television, which the gunman was able to watch on a monitor on the bus. Santiago blamed the live broadcasts for contributing to the violence as the standoff quickly deteriorated while police surrounded the vehicle.

'We do not want to pass sweeping judgment or make early conclusions except to say that our intention to peacefully end this hostage drama was spoiled when the hostage-taker suddenly exhibited violent behavior and began shooting the hostages," Philippine National Police Chief Director Gen. Jesus A. Verzosa said Tuesday in a statement.

National police said officials noted "some observations and defects during their close monitoring of the unfolding events."

The statement did not provide details. However, it listed poor handling of the hostage negotiations; inadequate capability, skills, equipment and planning of the assault team; improper crowd control; inadequate training and competence of the assault team leader; and noncompliance to media relations procedures in hostage situations.

"The investigation has got to find out, what was the turning point? What happened?" said Richard Gordon, chairman of the Philippine National Red Cross.

Gordon said survivors said the situation inside the bus changed dramatically toward the end of the 10-hour standoff.

"Apparently the man went berserk. He was telling everybody he was not going to harm [them]. ... He said that nobody's going to get harmed. He said that he was probably

going to die, but not the hostages," he said. Santiago said that Mendoza's family members spoke with him early in the standoff and that he appeared "very reasonable and very psychologically stable."

Mendoza was a decorated police officer, winning several accolades. But his career spiraled downward when he was dismissed a year ago for extortion, Manila Vice Mayor Ikso Moreno said, and he wanted his motion for reconsideration to be heard.

Moreno said that Mendoza's brother was arrested during the standoff because he was "guilty of conspiring with his brother" and allegedly helped instigate the shooting.

Gordon said the brother's arrest may have pushed the gunman over the edge.

'When he saw his brother getting accosted by the policemen, he went berserk and he started firing," he said.

Conditions: In a field, military operations in urban terrain (MOUT) or garrison environment interact with news media when no public affairs practitioners are present.

Standards: Identified the principles of interacting with the media.

Performance Steps

1. Role of the individual when interacting with the media.
    a. Check identification or press credentials. If identification or press credentials are produced, continue with interview. If no identification or press credentials are produced, refer the individual to your chain of command or public affairs representative.
    b. Recognize your rights.
        (1) You don't have to speak to the media.
        (2) You don't have to answer ail the questions.
        (3) You control the length of the interview.
    c. Maintain operational security (OPSEC). Do not discuss classified information.
2. Guidelines for speaking with the media.
    a. Think before you answer.
    b. Tell the truth. You should not lie or intentionally mislead members of the media.
    c. Discuss only things that you have direct responsibility for or have personal knowledge about. Speak at your level. You should discuss only matters for which you have direct knowledge.

d. Don't answer speculative (what if) or hypothetical questions.
e. Avoid jargon, acronyms, slang and technical terms.
f. Answer the question with which you are most comfortable when asked multiple questions.
g. Keep remarks brief and concise.
h. Assume everything you say may be printed or broadcast.
i. Use "I" not "we" when stating your opinion.
j. If you don't know the answer to a question or cannot discuss it for any reason, say so. Avoid using "no comment".

3. Inform the chain of command of interaction with the media.

Evaluation Preparation:

Setup: *Provide soldier with a realistic scenario of a simulated media interview situation. Use mock press credentials when necessary.*

Brief Soldier: *Tell the soldier he is about to be interviewed by the media. No public affairs representatives are present. Evaluate soldier on his ability to interact with the media.*

Performance Measures	GO	NO GO
1. Checked media representative for identification or credentials.	—	—
2. Stated three recognized rights.	—	—
3. Maintained OPSEC throughout the interview.	—	—
4. Discussed subject areas related to direct responsibility and personal knowledge.	—	—
5. Stated answers while avoiding speculation.	—	—
6. Performed interview without use of jargon, acronyms, slang or technical terms.	—	—
7. Employed concise remarks.	—	—
8. Ensured no "off-the-record" comments were made.	—	—
9. Stated answers, avoiding "no comment" response.	—	—
10. Informed chain of command of interaction with media.	—	—

Evaluation Guidance: *Score the soldier GO if 70 percent or more of the performance measures are passed. Score the soldier NO GO if less than 70 percent of the measures are passed. If the soldier scores NO GO on any performance measure, show or tell him what was wrong and how to perform the measure correctly.*

4.16 Rules for Successful Threat Intelligence Teams

Threat intelligence is quickly becoming a core element of risk management for many enterprises.

To truly understand risk, though, the enterprise must grasp and have the capability to handle emerging information security threats to its environment. Other areas of risk — financial risk, operational risk, geopolitical risk, risk of natural disasters — have been part of organizations' risk management plans since time immemorial; it's only these last few years that information security has bubbled to the top, and now companies are starting to put weight behind security threat intelligence programs.

Putting a team in place to manage threat intelligence, however, isn't as easy as other, more established areas of information security. First, it's newer, and second, organizations might not yet have the right skills and tools in-house.

With that in mind, we've identified four simple rules that will help organizations build and maintain a successful threat intelligence team.

(N.B. The rules are simple, but we do realize that implementation is not!)

4.16.1 Tailor Your Talent

It goes without saying that any team — threat intelligence or otherwise — is run by people, so hiring the right people with the right skills is critical. In some cases organizations can groom threat intelligence staff from within, from security operation center (SOC) teams to incident responders. Central skills like log management, networking expertise, and technical research (scouring through blogs, pastes, code, and forums) often come after years of professional information security experience.

Certain parts of threat analysis, however, necessitate distinct and practiced skill sets. Intelligence analysis, correlating and making predictions about threats based on (sometimes seemingly disparate) data, requires highly developed research and analytical skills and pattern recognition.

When building or adding to your threat intelligence team, especially concerning external hires, personalities matter.

Existing teams might feel threatened by new staff who appear to be "taking over" roles and responsibilities. Disgruntled employees are not productive employees. Thus, when forming

or adding to the threat intelligence team, pay close attention to the "soft skills" of candidates.

Make sure that teammates can not only all "play nicely in the sandbox," but that you, as a manager, are communicating frequently, clearly, and honestly about expectations. The interaction and workflow between teams should be pre-planned, and data sharing should facilitate easy integration for the teams responsible for making security verdicts.

4.16.2 Architect Your Infrastructure

Threat intelligence vendors provide strategic intelligence, but organizations should consider building in-house proprietary capabilities that deliver consistent, relevant, and actionable threat data.

Proprietary threat intelligence platforms (TIPs) have the advantage of being tailored to the organization's specific needs, and often come with a smaller price tag than commercial, off-the-shelf solutions. These custom-engineered solutions should integrate with external vendor systems to automatically collect, store, process, and correlate external data with internal telemetry such as security logs, DNS logs, Web proxy logs, Netflow, and IDS/IPS.

Of course, building powerful proprietary capabilities requires an experienced data architect.

This individual is responsible for designing fast and nimble data structures with which external tools integrate seamlessly and bi-directionally. The data architect should understand not only the technical needs of the organization, but he or she should be involved in a continuous two-way feedback loop with the SOC, vulnerability management, incident response, project management, customer-facing fraud (where applicable), and red teams. This collaborative process facilitates control changes and allows the architect to deliver threat data in a format and on a timeline appropriate for each group.

Notably, threat analysts should never spend time manually processing operational data, and the architect fills that important role of providing the data upon which the analyst draws conclusions that ultimately decrease strategic business risk.

4.16.3 Enable Business Profitability

The goal of every threat intelligence program should be to find emerging threats before they impact the business. Reducing the number of direct threats drives down risk, which in turn increases profitability. Threat intelligence teams must therefore know what the business identifies as levers of profitability in order to prioritize the identification and dissection of threat events and sources.

At the center of profitability are the business's strategic assets (customers, employees, infrastructure, applications, vendors). Protecting strategic assets is priority number one, and defensive controls need to be managed as threats emerge.

To ensure protection for key assets, threat analysts must be able to examine the larger threat picture and identify such things as general industry threats, trends, attacker TTPs (tactics, techniques, and procedures), and commodity malware. While an attack on one industry organization, for instance, might not result in a direct threat to your own organization, knowing that several enterprises have been been victims of a similar type of attack could indicate the need for hardened internal controls.

The ability to see the larger trends and drill down to direct threats against strategic assets means the threat intelligence team must understand what data it has available internally and what data it needs to source. Information gathering for an unknown purpose other than vague future applicability is a waste of resources, so set your sights on the information directly tied to the business and its levers of profitability.

4.16.4 Communicate Continuously

Enabling business profitability requires an understanding of the business's goals and roadmap.

To effectively set the roadmap, the executive layer also needs insight into current and future threats. If, for example, the business wants to acquire a partner but the partner is currently being targeted by hacktivist groups for what they deem unfair business practices, the executive team should have that intelligence before determining a market valuation and extending an offer. During a vendor evaluation, as another example, it is important to know if industry-specific malware, like BlackEnergy or Zeus, is emerging. Aligning one's business with a risky proposition is not a decision to be taken lightly.

Executives need to hear from the threat intelligence team how and why some of those threats translate to risk, and then learn if and how the risk of those threats can be mitigated. Organizational threats will always exist, and it's up to the business to decide its risk tolerance. Threat teams can aid the process by keeping executives informed but not spreading FUD (fear, uncertainty, and doubt). Delivering the message should be approached in a thoughtful, practical manner; do not overwhelm executives with technical details they neither care about nor understand. Their eyes are on the bottom line, and threat intelligence should be provided that supports moving in an upwards trajectory.

4.17 Construction Safety Practices

4.17.1 Excavation

Fencing

Where deep excavation is going on and there is likelihood of the public or cattle frequenting the area, suitable protective fencing should be erected and also sufficient number of notice boards and danger signals should be provided to prevent accidents by falling of persons in excavated trenches/pits. For excavated sites close to public roads/pathways, the area and the notice boards should have danger lights during darkness hours.

Barriers or coverings should be provided to excavations, shafts, pits and openings having a vertical fall distance of more than 2 ra, except during the period necessary for the access of persons and movement of plant equipment and materials. A structure made of timber or other suitable material should be erected for excavating and earthwork operations in order to prevent any fall of rock or displacement of earth or other material adjacent to or forming the sides of the excavations.

Shoring

1.2.1 Timber has been used traditionally for shoring. Aluminium shores using hydraulic jacks to hold them in place are also used these days. They are economical and lightweight, can be installed and dismantled easily and have a longer life. They are also more safe than timber to use.

Installation

As far as possible, the installation of shores should be done from the surface; that is, vertical shores should be placed from surface and the first horizontal brace should be installed just below the surface from above. The operator should go down in the trench with the help of a ladder which is long enough to install the next lower brace or trench jack, etc. Thus, the trench is made safe for him to descend to install additional horizontal braces. The trench jack or horizontal braces should never be used as a ladder for getting in or out of a trench as they are not designed to take vertical load.

Removal

When the removal of shoring is planned, the possible collapse of trench sides should be anticipated. The newly installed utility line will then be safeguarded in the normal course by being covered with loose or compact fill before shores are removed. If the trench is

likely to cave in on removal of the shores, it can be filled up to the bottom of the horizontal brace. It is a safe way for the worker to go down on the ladder and remove this brace, after which additional trench space can be filled up to the next horizontal brace or screw jack.

If the trench is to stay after the removal of shoring, the latter should not be removed till all work within the trench is completed and the newly installed utility line has been protected or covered.

A worker can then use a ladder to descend to the bottom of the horizontal trench jack and remove it The remaining horizontal jacks should be removed as he ascends the ladder. The removal of shoring is a hazardous work. A worker should never be permitted to engage in this work single handed.

Loose Site Material

The most serious safety problem associated with deep highway cut is that of landslides. This may occur during the work or any time after completion. Damages include loss of life or body injury, more often after heavy rains when the soil loosens and becomes heavy with water.

All loose stones, projecting lumps or earth should be removed from the trenches. The excavated sides of a trench should be adequately guarded.

Minimum Check and Clear Edge of Trench

There is a tendency to dump the excavated material just on the edge of the trench where excavation is done manually. The material may slide back into the trench or apply additional load on shoring. A provision of clear berm of a width not less than one-third of the final depth of excavations is recommended. In areas where this width of the berm is not feasible, the reduced berm width of not less than 1 m should be provided. It is always better to provide substantial toe board to prevent 'roll back' into the trench.

Plant and Machinery

The excavation may be done manually or with the help of equipment depending on the volume of work and site conditions. The risk of accidents in mechanical excavations are more due to the speed of excavation and dumping of the material. The following safety measures are recommended.

The excavating equipment should be parked at a distance of not less than the depth of the trench, or at least 6 m away from excavated sides for trenches deeper than 6 m.

With the use of power shovels and draglines, the banks of trenches become unstable

and thus dangerous for persons working nearby. These conditions should be watched and suitably remedied.

The vehicles should not be permitted to be driven too close to the pit. Care should be taken for locating roads leading to or from the pit. While loading manually, the vehicle should not be taken too near the wall of the pit. Use of spot logs will reduce risk of accidents where the vehicle is reversed for loading.

Workers should be provided with proper tools. Maximum hardness is the primary requirement for cutting edges and striking faces of tools. Overlooking the importance of providing the right tools for the job is perhaps the most serious risk to workers.

Workers using tools should guard against the danger arising out of the sudden movement of material which may throw them off balance. They should be adequately spaced to avoid being accidentally struck by tools of others working nearby.

Access and Escape

The workers should be able to escape fast in the event of any mishaps during excavation. It is recommended that one ladder should be provided for every length of 15 m or fraction thereof in the case of hazardous work, and 30 m of length or fraction thereof in the case of relatively less hazardous work.

Quite often the pathways become slippery due to accumulation of mud, sand or gravel. This should be avoided. Further, the pathways should be strong enough to withstand the intended use. Similarly, gangways should be of superior construction. The planks used should be strong, laid parallel to the length of the gangway and fastened together against displacement. They should be thick and have cleats for safe walking. Gangways should be kept clear of excavated material and other obstruction.

Other Precautions

Many accidents occur due to falls in unfenced trenches. Such accidents are more common during the rainy season. Fences, guards or barricades should be erected to prevent persons or livestock from falling into them. At night time, all public side walks and walkways should be adequately illuminated, and warning lights placed at proper sites to ensure safety of pedestrian and vehicular traffic. Sidewalks tend to become unstable during monsoons. They should be braced in the wet season. During excavation, the excavated sides should have the provision of steps or gradual slopes to ensure safety of men and machines in the area. It is possible that harmful gases and fumes are present in a trench. Gases, vapours and their metabolites absorbed by a human organ create morphological

abnormalities and the individual develops symptoms of poisoning. To prevent such mishaps, dilution and exhaust ventilation system should be used to reduce the concentration of gaseous matter to the recommended hygiene standards.

Explosive mixed gases may also be present in the trenches. Air containing more than 1.5 percent of flammable gases by volume is dangerous. Gases and fumes should be rendered harmless or discharged at points that are sufficiently remote from the trenches.

Internal combustion engines emit hydro-carbon, carbon monoxide and nitrogen oxides, which are dangerous to health. Hence no internal combustion engine should be operated in a trench unless adequate precautions are taken.

Burrowing or mining or what is known as 'gophering' should not be allowed. In any trench where such methods are being followed, the cavity belt should be eliminated by cutting it back to the bare slope before removing any further material from the section of the trench.

Workers normally take their lunch under the shade near their work sites. If shade is not available, they tend to sit in the shade or undercut of the trench. This practice should be prohibited. While excavating near or below the building foundations, the latter should be supported by shoring, bracing or underpinning as long as the trench remains open.

Common Hazards

Vibrations caused by the operation of machinery at sites adjacent to the excavated pits may cause collapse of walls unless they are properly braced. Further, quick sand is a dangerous phenomenon which necessitates the use of continuous steadying.

Damp sand is non-stable and for proper support it may need bracing *(see* Table 1).

Responsibility of Supervisor

Safety Check

Experienced and qualified supervisors should be put in charge of the excavation work. They should understand their responsibilities and the details of all safety rules. A supervisor should have the authority to enforce all safety rules at site, prevent the use of defective safety appliances, rigging of tools and materials and to disallow any worker to handle jobs for which he is not qualified. The supervisor should brief workers about the working plan before the start of the work and explain potential hazards to them. The excavation work should be inspected by a qualified engineer once a week and after every heavy spell of rain or storm. Defects, damage or dangers found should be reported immediately to the site incharge and corrective action taken. He should pay a special attention to water pipelines,

electric cables lying below the surface or during excavations of underground structures. The supervisors should ensure that all workers working under him are provided with safety appliances and protective equipment, and that they use it. The format of the Supervisor's Monthly Safety Report is given as Annex A. The worksheet for observation is attached as Annex B. General instructions for shoring and timbering of trenches is given in Table 1.

Table 1A Hard Soil General Instructions for Shoring and Timbering of Trenches
***(Clauses* 1.6 *and* 1.7.1)**

Item No.	Depth of Trench	Sheathing		Wales		Struts			
		Section	Horizontal Spacing, *Max*	Section	Vertical Spacing, *Max*	Section		Spacing	
						Width of trench not more than 2 m	Width of trench between 2 m and 4 m	Vertical	Horizontal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	m	cm	m	cm	m	cm	cm	m	m
1.	Over 2 but not over 3	5×20	2	15×15	1.5	10×10	10×15	1.5	3
2.	Over 3 but not over 5	5×20	1.5	15×15	1.5	10×15	15×15	1.5	3
3.	Over 5 but not over 6.5	5×20	1	20×20	1.5	15×15	15×15	1.5	3
4.	Over 6.5 but not over 8	5×20	Width of member	25×25	1.5	15×20	20×20	1.5	3
5.	Over 8 but not over 10	5×20	Width of member	20×30	1.5	20×20	20×25	1.5	3

Table IB Soil which may Crack or Crumble
***(Clauses* 1.6 *and* 1.7.1)**

Item No.	Depth of Treach	Sheathing		Wales		Struts			
		Section	Horizontal Spacing, Max	Section	Vertical Spacing, Max	Section		Spacing	
						Width of trench not more than 2m	Width of trench between 2m and 4m	Vertical	Horizontal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	m	cm	m	cm	m	cm	cm	m	m
1.	Over 1.5 but not over 2.5	5×20	1.5	10×15	1.5	10×10	—	1.5	3
2.	Over 2.5 but not over 3	5×20	1	15×15	1.5	10×10	15×15	1.5	3
3.	Over 3 but not over 5	5×20	0.5	15×20	1.5	10×15	15×15	1.5	3
4.	Over 5 but not over 6.5	5×15	Width of member	20×25	1.5	15×15	20×20	1.5	3
5.	Over 6.5 but not over 8	5×15	Width of member	25×25	1.5	15×20	20×20	1.5	3
6.	Over 8 but not over 10	8×20	Width of member	20×30	1.5	20×20	20×25	1.5	3

Table 1C Loose Sandy or Soft Solid or Soil which has been Previously Excavated
***(Clauses* 1.6 *and* 1.7.1)**

Item No.	Depth of Treach	Sheathing		Wales		Struts			
		Section	Horizontal Spacing, Max	Section	Vertical Spacing, Max	Section		Spacing	
						Width of trench not more than 2m	Width of trench between 2m and 4m	Vertical	Horizontal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	m	cm	m	cm	m	cm	cm	m	m
1.	Over 1.5 but not over 2.5	5×20	0.4	10×15	1.5	10×10	10×15	1.5	3
2.	Over 2.5 but not over 3	5×15	Width of member	15×20	1	10×15	15×15	I	3
3.	Over 3 but not over 5	5×15	Width ofmember	20×20	1.5	15×15	15×15	1.5	3
4.	Over 5 but not over 6.5	5×15	Width of member	20×25	1.5	15×15	15×20	1.5	3
5.	Over 6.5 but not ovfcr 8	8×20	Width of member	20×25	1.5	15×20	20×20	1.5	3
6.	Over 8 but not over 10	8×20	Width of member	25×25	1.5	20×20	20×20	1.5	3

Table ID Soil Under Hydrostatic Pressure
***(Clauses* 1.6 *and* 1.7.1)**

Item No.	Depth of Treach	Sheathing		Wales		Struts			
		Section	Horizontal Spacing, Max	Section	Vertical Spacing, Max	Section		Spacing	
						Width of trench not more than 2m	Width of trench between 2m and 4m	Vertical	Horizontal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	m	cm	m	cm	m	cm	cm	m	m
1.	Over 1.5 but not over 2.5	5×15	Width of member	15×20	1.5	10×10	15×15	1.5	3
2.	Over 2.5 but not over 3	5×15	Width of member	15×25	1	10×15	15×15	1.5	3
3.	Over 3 but not over 5	8×20	Width of member	25×25	1.25	15×15	15×15	1.25	3
4.	Over 5 but not over 6.5	8×20	Width of member	25×30	1.25	20×20	20×20	1.25	3
5.	Over 6.5 but not over 8	10×20	Width of member	25×35	1	20×20	20×25	1	3
6.	Over 8 but not over 10	10×20	Width of member	35×35	1	20×25	25×25	1	3

1.7.2 Record Keeping

Certificates and reports received by a contractor in respect of any test, inspection or examination of any equipment, excavation, shores, earthwork, etc, should be kept at the relevant construction site. These certificates and reports should be readily available for inspections by senior officers and other concerned authorities.

4.17.2 Drilling and Blasting

Drilling and blasting is a major safety hazard on construction sites. Accidents generally happen due to the mishandling of explosives during transportation, carelessness in their storage, misfire, and not guarding the blasting area. The overconfidence on the part of workers/supervisors may also lead to accidents.

Transportation of Explosives

Three important items that need the consideration are:

a) Mode of transport,

b) Handling for transportation, and

c) Traffic on road and road conditions.

Explosives should always be transported in specially designed vehicles bearing special signs or inscription 'DANGER EXPLOSIVES'. Vehicles to be used for transporting explosives shall be in good working condition and shall have a light wooden or nonsparking metal like copper, brass, etc. Electrical wiring in vehicle shall be fully insulated so as to prevent danger of short circuiting and at least two fire extinguishers (of carbon tetrachloride type) shall be carried. No metal except approved metal truck bodies shall be allowed to come in contact with cases of explosives. Metal, flammable or corrosive substances shall not be transported with explosives. Smoking shall be prohibited in vehicles carrying explosives and no' unauthorised persons shall travel in vehicle carrying explosives. Loading and unloading of explosives shall be done carefully by trained staff and supervised by qualified personnel. If possible, the traffic on the road while carrying explosives should be regulated specially in ghat and city areas.

The speed of explosive van and distance between the vehicle shall be regulated as per safety rules depending on road conditions. Badly maintained roads or speed breaker may jolt the explosives in the van if not properly placed or packed.

Handling Explosives

Dynamite may cause severe headaches, more so when it is unwrapped and handled with bare hand. Different brands and strengths of the dynamite vary in their headache producing property. Persons handling explosives should not smoke and carry no match boxes.

A complete list of safety precautions recommended by the manufacturers will be found in each box of dynamite and the same should be followed.

Indian Explosives Act, 1984

Storage of explosives is regulated by *Indian Explosives Act,* 1984 and provisions thereunder should be strictly observed. Accidental detonation of explosives during storage may be caused due to the following reasons:

a) Use of unsuitable rooms for storing explosives;

b) Unsystematic control of wiring systems, fire- alarm systems, store closing devices and stray currents; and

c) Careless handling, unwrapping and distribution of explosives.

Guidelines for Storage of Explosives

a) Explosives shall be stored only in a magazine or an isolated building which is clean, dry, well ventilated, seasonally cool, correctly located, substantially constructed, bullet proof and fire resistant and securely locked.

b) Actual requirements of explosives shall be drawn from the magazine and transported to the site.

c) In case of work at scattered places and for a small duration portable magazines shall be used and kept within a fence in a safe place and properly guarded.

d) These shall not be carried in the pockets of any clothing on any person.

e) Blasting caps, electric blasting caps or primers shall not be stored in the same box container or room with other explosives.

f) Explosives, fuse or fuse lighters shall not be stored in a damp or wet place or near oil, gasoline, cleaning solutions or solvents or near radiant or steam pipes or other sources of heat.

g) Smoking shall not be permitted within the fencing around the explosive magazine. No matches, open lights, or other fire or flame shall be allowed near the magazine.

h) Persons entering the magazine shall not have shoes with iron nails or other sparking metal.

Accidents while Using Explosives

Most of the accidents during the use of explosives are caused due to the following reasons:

a) Faulty loading of blast holes,

b) Failure to withdraw fast enough from the blast area,

c) Returning to blasting points too soon after firing, and

d) Presence of strangers near the blasting point, and

e) Premature detonation or misfire.

Precautions During Usage of Explosives

Following precautions should be taken during usage of explosives:

a) Any package containing explosives shall not be dragged, dropped or handled roughly. They shall be opened only at a safe distance and properly shielded from the packages of explosives in bulk storage.

b) No person shall strike, tamper with, or attempt to remove or investigate the contents of a blasting cap or attempt to pull out the crimped safety fuse out of a blasting cap.

c) Children, unauthorised or unwanted persons shall not be present where explosives are being handled.

d) No person shall handle, use or be near explosives during the approach or progress of any electrical storm. All persons shall retire to a place of safety.

e) Deteriorated or damaged explosives shall not be used and should be disposed off. Further no attempt shall be made to soften hard set explosives by heating over a fire or by rolling the explosive on the ground.

Guidelines for Supervision

The supervisors should take the following basic precautions at the blasting sites:

a) Smoking or carrying match boxes should be prohibited.

b) The package containing explosives should not be dropped or opened with metal tools.

c) Explosives should not be carried on the body of a person.

d) Persons not required during blasting should stay away.

e) Explosives should not be handled during the approach or progress of electrical storms.

f) Heating of explosives should never be done.

g) Explosives that have aged, deteriorated or are damaged should never be used.

h) Explosives should be placed in a hole that is not wet, is away from shocks/ vibrations, and does not have rock splinters or sharp objects.

j) The fuse and the wire leads should be without top kinks.

k) Explosives should not be kept at places where they are exposed to flame, excessive heat or sparking.

Drilling for Blasting

A complete geologic and engineering evaluation is essential before drilling so as to avoid landslides after blasting. The face of the rock should be carefully examined to determine the possible presence ofunfired explosives.

Guidelines for Loading Blasting Agent

a) All duct holes shall be sufficiently large to admit freely the insertion of explosion cartridges of explosives.

b) Tamping shall be done only with wooden rods without any metal parts.

c) Primer shall never be tampered.

d) If the loaded holes did not actuate no drilling within 17 m of the hole shall be done.

e) While loading after enlarging the hole or drilling, it must be ascertained that it is cool and does not contain any metal or burning or smouldering material. The temperature in excess of 65°C are dangerous.

Shot Firing

Electrical Circuit

Three main systems commonly used in blasting are— Condenser-discharge blasting machines, mechanically operated blasting machines and power line circuits. Of these three, the condenser-discharge blasting machine system is the most widely used. It is simple to operate and assures adequate firing current for almost any size of shot.

Guidelines for Firing

a) Before firing, sufficient warning shall be given to enable the people working in the blasting area to get out of the danger zone.

b) Any power circuit used for firing electric blasting caps shall not be grounded.

c) After firing the leading wires shall be immediately disconnected from the machine and short circuited.

d) Safety fuse only shall be used where sources of extra means of electricity is present.

Safety Fuse

In most construction jobs, the cap and fuse are normally used for secondary blasting. The length of a fuse should not be less than 120 cm, and the burning rate not more than 60 cm per minute.

The fuse wire should be lighted with a fuse lighter designed for the purpose. It should be lighted until sufficient stemming has been placed over the explosives. Only the prescribed explosives in the required quantity should be used in underground work.

As the fumes caused by the explosives may take a long time to emit out of the underground structure, a foul air duct of the specified size may be used to clean the air. It is more effective than a blow or pressure line. The velocity of the air at the delivery end should not be less than 0.2 m/s.

Precautions for Firing

Precautions Before and After Firing

a) Blasting shall be carried out during the fixed hours everyday or fixed days in a week. This information shall be amply publicised.

b) Road closing barriers should be provided at least 400 m away when firing is to take place.

c) The beginning of the firing should be followed by loud sirens and similarly the completion of the firing should be succeeded by loud sirens.

d) The shot firer shall not return to the blasting site after firing until at least 5 min have elapsed.

e) In case of electric shot firing the shot holes shall be examined after firing and incase of misfire no person shall be allowed to approach the blasting site for at least 5 min.

f) In case of shot firing with safety fuse, utmost care shall be taken to count the number of loud reports to ensure that all the shots have fired and in the event of blasting site for at least 30 min.

g) In case of misfiring no person other than those fully authorized shall approach the holes until the following operations have been performed in respect of each of the misfired holes.

    1) If a misfire is due to faulty cable or faulty electrical connection the defect shall be resumed and the shot fired.

    2) The stemming shall be floated out by use of water or air jet from hole until the hole has been opened to within 60 cm of the charge upon which water will be siphoned then fresh charge placed and duly detonated or a new hole shall be drilled 60 cm away from the old bore, parallel to it, about 60 cm less in depth and the new hole charged and duly fired.

3) Careful search shall be made of unexploded material in the debris of the second charges.

The blasting operations shall be carried out scrupulously following the stipulations of the *Indian Explosives Act,* 1984 and Rules made thereunder and by agencies in possession of licensing authority.

The preparation of charges, the charging of holes and firing shots shall be carried out by or in the presence of a responsible person with experience of handling explosives.

No more than 8 holes shall be loaded and fired at any one time.

It should be ensured that projection of fragment stones by explosives is minimum. For this purpose, it is recommended that before exploding any blasting charge, a strong wooden lattice of sufficient weight be placed immediately over the drift

The blasting operation shall be carried out strictly in accordance with the stipulations under the license to carry out blasting operation.

Disposal of Explosives

a) Consult the manufacturers while disposing or destroying explosives and it should be done in strict accordance with the approved methods.

b) The materials used in the packing of explosives as empty cartridges, boxes, liners or other materials should not be left lying around.

c) The materials used in the packing of explosives as wood, paper, etc, should not be burnt in a stove, a fireplace or other conferred place, or to be used for any purpose.

d) The explosives should not be given on loan or parted or disposed off to anybody without the written permission of the competent authority.

In case of any theft, the matter should be reported to police and higher authority immediately.

4.17.3 Piling and deep foundations

General

A basic step in safety in piling is that one must know the elements of machinery and equipment, how they can cause accidents and what steps should be taken by the operator to avoid accidents. Machines and equipment differ widely, depending upon the process and

mode of piling, manufacturer's specialities, specification and allied factors. The safety requirements of each machine should be understood.

Piling Rigs

The legs of the tripod should be properly spiked in the ground. This will prevent accidents due slipping up of the tripod legs when rested on a paved ground or sleepers. The shear legs and bases become thin and fatigued with usage. They should be replaced frequently.

The failure of a pulley due to shearing of bolt or pin is quite common. Therefore, frequent check-ups of the pulley are essential. The wire rope forms the link between the main piling tools and the winch. Following regular checks are required in this respect.

a) Check for loose strands and wear, deformation, corrosion and breakage of wires.

b) Check whether the end of the rope has become loose or has slipped wire clips or wire sockets.

c) Check against slippage of rope from the sleeve during work.

d) Check if there is any occurrence of torsion while working and if so, rewind it normally at once.

e) Check if there are any adhesions like mud, earth, etc, on the rope. If so, clean with wire brush or compressed air.

f) Check if the grease applied on the rope is adequate.

g) Check for wear and cracks on the lining of the clutches and brake band; and the engine condition.

Field Operations

The common hazards in various field operations such as sheet piling, well foundation are mentioned below:

Sheet piling are normally used for construction of cassion or cofferdam to permit the de-watering of water for efficient under water working. They are handled manually, lifted by cranes and lowered by hammer or vibrostroker. The accidents due to drowning and injuries while handling are very common. These can be minimized by adopting the following precautions:

a) Hand ropes should be tied to control/prevent the movement of steel sheet sections that are transported.

b) Stirrups should be provided to workers engaged in interlocking the sheets.

c) Adequate pumping facilities shall be provided at cofferdam. Also adequate means of escape, such as ladders and boats shall be provided at cofferdams for protection of workers in case of flooding.

d) Adequate supplies of life saving equipment shall be provided for workers employed on cofferdams.

When sheet sections are being removed their movement shall be controlled by cables and other effective means.

Well Foundation

The progress and safety of well sinking depends on the knowledge of cutting edges provided by the

4.18 Planning

Planning means looking ahead and chalking out future courses of action to be followed. It is a preparatory step. It is a systematic activity which determines when, how and who is going to perform a specific job. Planning is a detailed programme regarding future courses of action. It is rightly said "Well plan is halftone". Therefore planning takes into consideration available & prospective human and physical resources of the organization so as to get effective co-ordination, contribution & perfect adjustment. It is the basic management function which includes formulation of one or more detailed plans to achieve optimum balance of needs or demands with the available resources.

According to Urwick, "Planning is a mental predisposition to do things in orderly way, to think before acting and to act in the light of facts rather than guesses". Planning is deciding best alternative among others to perform different managerial functions in order to achieve predetermined goals.

According to Koontz & O'Donell, "Planning is deciding in advance what to do, how to do and who is to do it. Planning bridges the gap between where we are to, where we want to go. It makes possible things to occur which would not otherwise occur".

4.18.1 Steps in Planning Function

Planning function of management involves following steps:-

1. Establishment of objectives: -

a. Planning requires a Systematic approach'.

b. Planning starts with the setting of goals and objectives to be achieved.

c. Objectives provide a rationale for undertaking various activities as well as indicate direction of efforts.

d. Moreover objectives focus the attention of managers on the end results to be achieved.

e. As a matter of fact, objectives provide nucleus to the planning process. Therefore, objectives should be stated in a clear, precise and unambiguous language. Otherwise the activities undertaken are bound to be ineffective.

f. As far as possible, objectives should be stated in quantitative terms. For example, Number of men working, wages given, units produced, etc. But such an objective cannot be stated in quantitative terms like performance of quality control manager, effectiveness of personnel manager.

g. Such goals should be specified in qualitative terms.

h. Hence objectives should be practical, acceptable, workable and achievable.

2. Establishment of Planning Premises

a. Planning premises are the assumptions about the lively shape of events in future.

b. They serve as a basis of planning.

c. Establishment of planning premises is concerned with determining where one tends to deviate from the actual plans and causes of such deviations.

d. It is to find out what obstacles are there in the way of business during the course of operations.

e. Establishment of planning premises is concerned to take such steps that avoids these obstacles to a great extent.

f. Planning premises may be internal or external. Internal includes capital investment policy, management labour relations, philosophy of management, etc. Whereas external includes socio economic, political and economical changes.

g. Internal premises are controllable whereas external are non- controllable.

3. Choice of alternative course of action

a. When forecast are available and premises are established, a number of alternative course of actions have to be considered.

b. For this purpose, each and every alternative will be evaluated by weighing its pros and cons in the light of resources available and requirements of the organization.

c. The merits, demerits as well as the consequences of each alternative must be examined before the choice is being made.

d. After objective and scientific evaluation, the best alternative is chosen.

e. The planners should take help of various quantitative techniques to judge the stability of an alternative.

4. Formulation of derivative plans

a. Derivative plans are the sub plans or secondary plans which help in the achievement of main plan.

b. Secondary plans will flow from the basic plan. These- are meant to support and expediate the achievement of basic plans.

c. These detail plans include policies, procedures, rules, programmes, budgets, schedules, etc. For example, if profit maximization is the main aim of the enterprise, derivative plans will include sales maximization, production maximization, and cost minimization.

d. Derivative plans indicate time schedule and sequence of accomplishing various tasks.

5. Securing Co-operation

a. After the plans have been determined, it js necessary rather advisable to take subordinates or those who have to implement these plans into confidence.

b. The purposes behind taking them into confidence are :-

c. Subordinates may feel motivated since they are involved in decision making process.

d. The organization may be able to get valuable suggestions and improvement in formulation as well as implementation of plans.

e. Also the employees will be more interested in the execution of these plans.

6. Follow up/Appraisal of plans

a. After deposing a particular cpurse of action-, it is put into action.

b. After the selected plan is implemented, it is important to appraise its effectiveness.

c. This is done on the basis of feedback or information received from departments or persons concerned.

d. This enables the management to correct deviations or modify the plan.

e. This step establishes a link between planning and controlling function.

f. The follow up must go side by side the implementation of plans so that in the light of observations made, future plans can be made more realistic.

4.18.2 Characteristics of planning

1. **Planning is goal-oriented.**
   a. Planning is made to achieve desired objective of business.
   b. The goals established should general acceptance otherwise individual efforts & energies will go misguided and misdirected.
   c. Planning identifies the action that would lead to desired goals quickly & economically.
   d. It provides sense of direction to various activities. E.g. Maruti Udhyog is trying to capture once again Indian Car Market by launching diesel models.
2. **Planning is looking ahead.**
   a. Planning is done for future.
   b. It requires peeping in future, analyzing it and predicting it.
   c. Thus planning is based on forecasting.
   d. A plan is a synthesis of forecast. .
   e. It is a mental predisposition for things to happen in future.
3. **Planning is an intellectual process.**
   a. Planning is a mental exercise involving creative thinking, sound judgement and imagination.
   b. It is not a mere guesswork but a rotational thinking.
   c. A manager can prepare sound plans only if he has sound judgement, foresight and imagination.
   d. Planning is always based on goals, facts and considered estimates.
4. **Planning involves choice & decision making.**
   a. Planning essentially involves choice among various alternatives.
   b. Therefore, if there is only one possible course of action, there is no need planning because there is no choice.
   c. Thus, decision making is an integral part of planning.
   d. A manager is surrounded by no. of alternatives; He has to pick the best depending upon requirements & resources of the enterprises.
5. **Planning is the primary function of management/Prirpacy of Planning.**
   a. Planning lays foundation for other functions of management.
   b. It serves as a guide for organizing, staffing, directing and controlling.

c. All the functions of management are performed within the framework of plans laid out.

d. Therefore planning is the basic or fundamental function of management.

6. Planning is a Continuous Process.

a. Planning is a never ending function due to the dyrfamic business environment.

b. Plans are also prepared for specific period f time and at the end of that period, plans are subjected to revaluation and review in the light of new requirements and changing conditions.

c. Planning never comes into end till the enterprise exists issues, problems may keep cropping up and they have to be tackled by planning effectively.

7. Planning is all Pervasive.

a. It is required at all levels of management and in all departments of enterprise.

b. Of course, the scope of planning may differ from one level to another.

c. The top level may be more concerned about planning the organization as a whole whereas the middle level rnay be more specific in departmental plans and the lower level plans implementation of the same.

8. Planning is designed for efficiency.

a. Planning leads to accomplishment of objectives at the minimum possible cost.

b. It avoids wastage of resources and ensures adequate and optimum utilization of resources.

c. A plan is worthless or useless if it does not value the cost incurred on it.

d. Therefore planning must lead to saving of time, effort and money.

e. Planning leads to proper utilization of men, money, materials, methods and machines.

9. Planning is Flexible.

a. Planning is done for the future.

b. Since future is unpredictable, planning must provide enough room to cope with the changes in customer's demand, competition, govt, policies etc.

c. Under changed circumstances, the original plan of action must be revised and updated to male it more practical.

4.18.3 Advantages of planning

1. Planning facilitates management by objectives.

a. Planning begins with determination of objectives.

b. It highlights the purposes for which various activities are to be undertaken.

c. In fact, it makes objectives more clear and specific.

d. Planning helps in focusing the attention of employees on the objectives or goals of enterprise

e. Without planning an organization has no guide.

f. Planning compels manager to prepare a Blue-print of the courses of action to be followed for accomplishment of objectives.

g. Therefore, planning brings order and rationality into the organization.

2. Planning minimizes uncertainties.

a. Business is full of uncertainties.

b. There are risks of various types due to uncertainties.

c. Planning helps in reducing uncertainties of future as it involves anticipation of future events.

d. Although future cannot be predicted with cent percent accuracy but planning helps management to anticipate future and prepare for risks by necessary provisions to meet unexpected turn of events.

e. Therefore with the help of planning, uncertainties can be forecasted which helps in preparing standbys as a result, uncertainties are minimized to a great extent.

3. Planning facilitates co-ordination.

a. Planning revolves around organizational goals.

b. All activities are directed towards common goals.

c. There is an integrated effort throughout:the.enterprise in various departments and groups.

d. It avoids duplication of efforts. In other words, it leads to better co-ordination.

e. It helps in finding out problems of work performance and aims at rectifying the same.

4. Planning improves employee's moral.

a. Planning creates an atmosphere of order and discipline in organization.

b. Employees know in advance what is expected,,of them and therefore conformity can be achieved easily.

c. This encourages employees to show their best and also earn reward for the same.

d. Planning creates a healthy attitude towards work environment which helps in boosting employees moral and efficiency.

5. Planning helps in achieving economies.

a. Effective planning secures economy since itieads to orderly allocation ofresources to various operations.

b. It also facilitates optimum utilization of resources which brings economy in operations.

c. It also avoids wastage of resources by selecting most appropriate use that will contribute to the objective of enterprise. For example; raw materials can be purchased in bulk and transportation cost can be minimized. At the same time it ensures regular supply for the production department, that is, overall efficiency.

6. Planning facilitates controlling

a. Planning facilitates existence of certain planned goals and standard of performance.

b. It provides basis of controlling.

c. We cannot think of an effective system of controlling without existence of well thought out plans.

d. Planning provides pre-determined goals against which actual performance is compared.

e. In fact, planning and controlling are the two sides of a same coin. If planning is root, controlling is the fruit.

7. Planning provides competitive edge

a. Planning provides competitive edge to the enterprise over the others which do not have effective planning. This is because of the fact that planning may involve changing in work methods, quality, quantity designs, extension of work, redefining of goals, etc.

b. With the help of forecasting not only the enterprise secures its future but at the same time it is able to estimate the future motives of it's competitor which helps in facing future challenges.

c. Therefore, planning leads to best utilization of possible resources, improves quality of production and thus the competitive strength of the enterprise is improved.

8. Planning encourages innovations

a. In the process of planning, managers have the opportunities of suggesting ways and means of improving performance.

b. Planning is basically a decision making function which involves creative thinking and imagination that ultimately leads to innovation of methods and operations for growth and prosperity of the enterprise.

4.18.4 Disadvantages of planning

Internal Limitations

There are several limitations of planning. Some of them are inherit in the process of planning like rigidity and other arise due to shortcoming of the techniques of planning and in the planners themselves.

1. Rigidity

a. Planning has tendency to make administration inflexible.

b. Planning implies prior determination of policies, procedures and programmes and a strict adherence to them in all circumstances.

c. There is no scope for individual freedom.

d. The development of employees is highly doubted because of which management might have faced lot of difficulties in future.

e. Planning therefore introduces inelasticity and discourages individual initiative and experimentation.

2. Misdirected Planning

a. Planning may be used to serve individual interestS rather than the interest of the enterprise.

b. Attempts can be made to influence setting of objectives, formulation of plans and programmes to suit ones own requirement rather than that of whole organization.

c. Machinery of planning can never be freed of'bias. Every planner has his own likes, dislikes, preferences, attitudes and interests which is reflected in planning.

3. Time consuming

a. Planning is a time consuming process because it involves collection of information, it's analysis and interpretation thereof. This entire process takes a lot of time specially where there are a number of alternatives available.

b. Therefore plannirig is not suitable during emergency or crisis when quick decisions are required.

4. Probability in planning

a. Planning is based on forecasts which are mere estimates about future.

b. These estimates may prove to be inexact due to the uncertainty of future.

c. Any change in the anticipated situation may render plans ineffective.

d. Plans do not always reflect real situations inspite of the sophisticated techniques of forecasting because future is unpredictable.

e. Thus, excessive reliance on plans may prove to be fatal.

5. False sense of security

a. Elaborate planning may create a false sense of security to the effect that everything is taken for granted.

b. Managers assume that as long as they work as per plans, it is satisfactory.

c. Therefore they fail to take up timely actions and an opportunity is lost.

d. Employees are more concerned about fulfillment of plan performance rather than any kind of change.

6. Expensive

a. Collection, analysis and evaluation of different information, facts and alternatives involves a lot of *;i* expense in terms of time, effort and money

b. According to Koontz and O'Donell, ' Expenses on planning should never exceed the estimated I benefits from planning.'

External Limitations of Planning

1. Political Climate- Change of government from Congress to some other political party, etc.
2. Labour Union- Strikes, lockouts, agitations.
3. Technological changes- Modern techniques and equipments, computerization.
4. Policies of competitors- Eg. Policies of Coca Cola and Pepsi.
5. Natural Calamities- Earthquakes and floods.
6. Changes in demand and prices- Change in fashion, change in tastes, change in income level, demand falls, price falls, etc.

ANNEX F
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