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Fire Hazards in the telecommunications industry

Report by: GE Frankona

The telecommunication sector is one of the world fastest-growing industries. By the end of 2000 spending on telecom equipment and services was expected to reach 5% of World GNP.

Today, telecommunication affects almost every facet of modern life. Businesses rely on standard telephone services, facsimile machines, e-mail, teleconferencing and video conferencing. They also may use credit card validators and electronic funds transfer functions. Besides some inconveniences for the public failure of standard telephone services or automatic teller machines (ATMs) - outages of telecommunication equipment may also have serious effects on public law and order, for example if emergency calls to fire departments, police or hospitals cannot go out.

Fire is only one possible cause of loss. Let us look at fire hazards in the telecom industry and their impact, and outlines ways in which these losses can be limited.

Hazards and layout

The hearts of telecommunication networks are located in buildings called central offices or switching centers. The size of these facilities varies widely, as does their importance in the network.

Equipment layout and functions, however, are similar. Large, multiple conductor cables enter the central office through a cable vault. For smaller, single-storey wire centers, the vault is a cut-off room, usually located in one corner of the building. For larger, multi-storey wire centers, the cable vault is a separate structure, usually situated below grade. The cables are supported by pipe racks and routed to ceiling penetrations where they enter the frame rooms.

In the frame room, ie the main distributing frame (MDF), conductors separate into pairs of wire for each circuit and connect to cables leading to the actual switching equipment in the switching room. Older equipment is open construction, while modern electronic switch service (ESS) equipment is

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Marine World Insurance Market 2000 Review

Report by: Willis

London Insurance Market

The London marine insurance market, which is dominated by Lloyd syndicates and insurance companies, is currently characterized by a feeling of expectation that the market in 12 months time, will be a different place to what it was at the beginning of this year.

Some Lloyds syndicates, for example Hiscox, have already realigned their operations, letting some well known underwriters go, while other agencies, like Limit, are awaiting the outcome of the merger with QBE Insurance to decide the fate of their underwriting strategy for the future. Certainly, capacity for some risks is contracting and some underwriters expect this trend to continue for the foreseeable future.

There are reports that capacity for the 2001 underwriting year will be above Sterling Pound11 billion (US\$16.5 billion), up from Sterling Pound10 billion for the current year. While this recognizes the strength and confidence of Lloyds, the market place itself has seen a dramatic reduction in the number of syndicates trading. For example, in 1990 there were 401 syndicates in total, of which 129 were marine. In 2000 there are a total of 123 syndicates with only 45 marine syndicates. It is a concern to market practitioners that this sum is now in fewer hands.

Change in the London marine insurance market is being driven by reinsurers, on whom direct insurers are heavily dependent. Reinsurers have paid some heavy losses and are taking measures to address this negative situation. The reinsurance market is hardening, which should leave direct insurers with no option but to increase rates and retention.

Hull

Whilst underwriters were attempting to (talk up) their market, good intentions were generally failing to manifest themselves in the appropriate action.

For any insurance market to recover, certain ingredients are required; firstly the losses have to be sufficiently painful and all underwriters would agree that 2000 will be another thoroughly unprofitable year. The second ingredient is also now firmly in place, which is increasing reinsurance costs and the third ingredient is a refusal to offer multiyear policies without some form of annual review. The remaining question must concern the stamina of the capital providers to continue to fund the losses. It is a peculiarity of insurance markets that there is rarely any structure that allows underwriters to stand aside and cease

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somewhat enclosed and represents a greater value per unit area. The signals are multiplexed and boosted in the transmission room before they leave the central office through the cable vault. Extremely densely hardware-populated computer facilities are usually associated with modern switching centers.

The computers handle traffic control, fault supervision, billing, accounting and all similar electronic data processing (EDP) functions. The rooms contain telecommunication equipment and interfaces. Other supporting equipment includes standby batteries, generators, and offices.

Depending on the size of the switching center, the amount of combustibles can be very large. Due to the large number of telecommunication cables in the under floor space and dense hardware population, especially in the switching room, the combustible loading and continuity of combustibles is greater than normal for a computer room.

The cables are insulated with plastic, rubber and rubber compounds. The use of fiber optic cables reduces the amount of cable space required by allowing more telephone traffic. Other combustible loading includes printed circuit boards, electronic equipment, transformers and plastic housings.

Central offices are highly automated and during normal business days are occupied by personnel who perform maintenance, repairs, and system monitoring.

During off-hours, weekends, and holidays, the switching stations are usually unoccupied with assigned standby personnel.

Losses

1 - Hinsdale, USA

On Sunday, 9 May 1988, an electrical fault caused a fire in a central office of Illinois Bell Telephone (IBT) in Hinsdale, Illinois, USA, a community 32 km south-west of Chicago. Since telephone service failed early during the fire, it took 45 minutes before the fire department arrived at the site. Heavy, black smoke made it difficult for firefighters to move into the building and to locate the fire.

Both the uninterruptible nature of the power supply and the lack of emergency shutdown procedures hampered fire-fighting efforts. Officials could not be informed to shut down power, and the emergency generators and batteries provided emergency power. Since dry chemical and halon extinguishers were ineffective and water had to be used, firefighters were constantly exposed to electrical shock. It took firefighters more than two hours to shut down power, enabling them to control and extinguish the fire. The fire was declared officially out more than six hours after the first fire crews had arrived on the scene.

The actual fire was confined to an area of about 10 m x 13 m on the ground floor toll terminal area, where cables were burned to various degrees. Smoke residues covered most of the ground and parts of the first floor. The most severe damage away from the fire was the result of corrosive gases carried in the smoke. Hydrochloric acid was formed when chlorine was released during the burning of the cable insulation and combined with the water used to fight the fire. It formed a destructive acid layer, which immediately corroded the equipment that survived the fire. For interim service the existing equipment was cleaned, and humidity levels in the building were lowered to stop corrosion as much as possible. However, the equipment was considered unreliable for providing telephone service over an extended period and eventually had to be replaced.

Besides the physical damage, the impact on the communities was significant.

Local and long distance telephone services were completely down for weeks and were interrupted in some surrounding communities for several days. A total of 38,000 customers were concerned. It has been estimated that the telephone interruption directly affected 9,000 businesses and 100,000 employees: Communications for critical facilities such as the police, fire and medical services were badly impaired (no emergency calls possible). Both Chicago airports lost crucial communication lines to the Federal Aviation Administration for one day, resulting in flight delays.

Due to the unavailability of telephone and computer links, banks, travel agencies, and real estate firms faced problems such as contacting customers and managing information.

For the same reason, local investment offices could not do much business and many did not open the day after the fire. 35,000 calls to a hotel reservation office had to be re-routed. A floral delivery service lost its computer connection to 12,500 florists throughout the nation. Already during the fire, re-routing of services began, with emergency services for the police, fire departments and hospitals being restored the day after the fire. It took until 20 May to get all telephone lines temporarily back in service.

2 - Reutlingen, Germany

A similar incident on 1 August 1998 in Reutlingen, Germany, a town 20 km south-east of Stuttgart, temporarily left 140,000 people without telephone service. A fire in the transmission room on the 2nd floor of this two-storey building spread over the cable trays. Since the building was locked, the fire department had to force entry into the building. Attempts to call an official of the German telephone company Telekom were unsuccessful due to lost telecom lines.

Arising again hampered fire-fighting efforts. As in the Hinsdale fire, the emergency generators and back-up batteries kicked in once the public power supply was shut off. Carbon dioxide extinguishers did not work and foam was used. The fire was officially declared out nearly six hours after the first fire alarm was received at the fire department.

In addition to the physical damage, two-thirds of the city telephone connections were out of service. Several surrounding communities were without service as they were normally routed through Reutlingen. A total of 54,000 telephones were affected. No emergency calls to the fire department, police, ambulance or utility companies were possible. ATMs were down. Missing telephone and computer links impacted local business.

Here, as in Hinsdale, re-establishing telephone service to the fire department, police and ambulances and providing the possibility for emergency calls was the first priority. Regular telephone service resumed on 14 August 1998, two weeks after the fire.

Lessons

Fires like in Hinsdale and Reutlingen are fairly rare. In 1993 the Network Reliability Council (part of the Federal Communications Commission) presented the results of a five-year study about fire Losses in the telecommunication industry in the United States. During this period 189 fires were reported. Most of the fires involved AC/DC equipment, batteries and diesel generators (33%) as well as building systems (19%; eg elevator motors, space heaters, lighting fixtures, etc.). Only 10% (19 fires) involved telecommunication or peripheral equipment.

Media coverage and the impact of fires in telecommunication buildings leave the general exception that such fires are comparable to large warehouse or home fires. In reality, telecommunication equipment fires usually involve small quantities of material burned and small areas of fire damage.

The smoke and corrosive combustion products do most of the physical damage in telecommunication fires in that they may necessitate the replacement of this high-value equipment.

Modern digital communication equipment is also very sensitive to rapid changes in temperature and humidity.

Service disruptions can range from several minutes to several weeks. In addition to the inconvenience of not having reliable telephone service, many companies might endure financial hardship because communication by telephone and computer links is an essential component of their business operation.

Financial impact

In the Hinsdale fire, damage to the structure and equipment replacement costs were estimated at USD 40-60 million. The personal inconveniences, lost business, and alternative activities that communities had to undertake to ensure that their citizens were protected, resulted in costs not reflected by the direct fire loss estimates.

The following numbers show another aspect of the financial impact of a service disruption: On 14 June 1999 Internet auction site e-bay saw its stock plummet by USD 4 billion due to a 22-hour outage, every hour of downtime resulting in an estimated USD 200,000 in lost sales. A 75-minute outage at e*trade caused its stock to drop by USD 6.50 per share (USD 1.5 billion total value). A 19-hour outage at America Online (AOL) led to its stock falling by USD 4.50 per share (total of USD 4.8 billion).

Loss prevention and control

Prevailing loss prevention and control philosophy is to use a combination of compartmentation, fire-resistant construction, automatic smoke detection systems, portable fire extinguishers and standpipe systems.

Management programmes:

Develop detailed management programmes to cover all aspects of loss prevention and control.

These programmes should foremost help to prevent fires. The above-mentioned study by the Network Reliability Council indicates that vendors, contractors or telecommunication personnel initiated 53 fires (28%). The probable cause of the Hinsdale

fire was a power cable, which was possibly damaged during maintenance activities. A contributing factor to the losses in Hinsdale and Reutlingen was the lack of a de-energisation plan.

Some fire-fighting personnel may refuse to enter unless all power is off. An access key for fire department use at unoccupied telephone company offices, to prevent delays in accessing the building, should be provided. The programmes should also address actions to be taken after a loss has occurred.

Construction:

Central offices should be of non-combustible construction. Physically separated cable vaults, frame rooms, switching centers, battery rooms, tape and disk vaults and mechanical equipment rooms could limit the scope of a fire.

Additional internal separations could be an option if operating procedures allow. Enclosed stairways, elevators, chutes and other openings should prevent a vertical fire spread. Sealed and water-proofed floors could limit the water damage from fire control operations. Attention should be given to cable penetrations through fire walls and floors. Though the fire-stopping material around the cable penetrations prevented the fire in Hinsdale from spreading to the first floor, it could not completely stop smoke from passing through. Smoke and corrosive gases are one of the most severe threats away from the fire. A potential solution to the acid gases comprises the use of halogen free insulation. While the replacement of existing cables could pose a large risk of power outages and is generally not recommended, the use of these cables should be considered for new installations. For active smoke control, the heating, ventilating and air conditioning (HVAC) system should be adapted to provide smoke removal from the building in the event of fire.

Interior protection:

Sprinkler protection should be installed throughout the building. Gaseous extinguishing systems (carbon dioxide, FM 200, water mist) may be an alternative in small rooms. Raised floors should be included in this protection. For manual fire

suppression fire extinguishers, a standpipe system and hose connections should be installed.

Special hazards:

Cable vaults could serve as a collection point for gases or vapours that may enter the building along the path of the buried cables, causing explosion hazards. In these cases gas detectors are recommended. All unused cables should be removed to reduce the fire load. Emergency shut-off switches should be installed to disconnect power to all electronic equipment. This could not only prevent re-ignition of a fire, but also limit the damage to equipment on contact with water from fire-fighting operations.

Surveillance:

Air-sampling-type smoke detectors and in certain instances gas detectors which detect combustion products, could give an early indication of a fire. All fire alarms should be received at a constantly attended station. If alarms are received at a remote unoccupied station, the system must be able to differentiate between telephone trouble conditions and fire alarms. Alarms that are directly connected to the fire department could be an option.

Conclusion

Central offices of a telecom company are a major bottleneck of the modern industrial world. Today, almost all business is in some way dependent on the phone system. As the world is entering the e-business age, this bottleneck has become narrower than ever before. The two losses described in this article illustrated the damaging consequences of a fire event to the affected communities and industries. Even if limited in size and time, the consequences of a loss can be expected to be more severe than history may indicate.

The adequate building design of new switching stations, proper fixed fire detection and protection systems and well-implemented comprehensive loss prevention management programmes will help reduce the risk of an interruption of services.

Properly implemented and tested business continuity plans will contribute to continued communications, even after a fire loss.

underwriting in adverse conditions.

While it is still not unknown for major fleets with reasonable records to obtain improved terms, particularly if they are prepared to abandon their current underwriters, we expect that the number of hull underwriters prepared to maintain market share with unprofitable business will continue to dwindle. However, in the absence of a serious catastrophe, we do not foresee the required increases in premium (probably at least 50% overall), being achieved without further withdrawals of capacity.

Outside London there have been consolidations, particularly in Norway, where the four largest hull underwriters (Vesta, Storebrand, Unitas and Bergen Club) will be paired off into two units, both headquartered in Bergen. In New York, apart from the downgrading of Reliance, there have been no substantive changes. Neither have been any major changes in the Paris market.

Cargo

The Cargo market is finally starting to show signs of hardening.

A number of underwriters are taking a stance on renewals with no reductions being given. In an increasing number of cases, rises are being quoted. The changes are beginning to be felt as underwriters start the process of planning for their own excess of loss reinsurance protections for 2001 and beyond. Capacity on the reinsurance side is contracting which, inevitably, puts upward pressures on reinsurance pricing structures for cargo underwriters 2001 renewals.

There is still more capacity than is required, but increasingly that capacity is becoming more selective in the risks underwriters choose to write. In addition, the providers of corporate capacity to Lloyds syndicates are demanding better results. If this is not achieved the capacity providers will withdraw and seek better returns elsewhere.

Liability

In common with other classes of marine business, the liability market is now showing initial signs of hardening. Underwriters are now generally paying more for their own reinsurance protections than they were twelve months ago and, once this factor is taken into account, together with the latest batch of poor underwriting results, underwriters have come to the inevitable conclusion that premium levels must start to increase. Otherwise, it will not be possible for them to generate the levels of profitability required to secure the continued participation of their capital providers. However, the main problem for underwriters, in the marine liability market, is that of over-capacity.

Underwriters can only insist upon a premium increase, or even an (as expiring), on renewal of accounts where they are confident they will not be undercut by competitors eager to attract new business.

Therefore, until the number of market participants in this sector is reduced, it is difficult to see how the current effort by some underwriters to impose a general increase in rates can succeed.

It is also the case that underwriters are currently less willing to offer long term deals to clients. This is obviously due to the fact that they are anticipating general market premium increases during the next twelve months and do not want to miss out on these by committing themselves to

accepting long policy periods at current pricing levels.

International Markets

United States

The results for the US marine market remain quite mixed however, with most insurers reporting poor results, and only a few markets boasting modest profitability for the 1999 year. While other segments of the insurance market (property/casualty) seem to be posturing for firming of rates, precipitated in large by the firming of the reinsurance market, the marine market, notwithstanding less than stellar results, will most likely maintain its competitive posture for 2000.

As previously reported, during the past five to ten years the marine market has outperformed the overall property/casualty market. This market was awash with capital, and as such many of the major players were eager to have that capital work more profitably for them.

Marine Cargo

We see a continuing introduction of new or revitalized capacity. This in turn leaves the cargo market pretty much unchanged, however, in all respects still quite competitive.

With the continued soft market, in part the result of mergers among insurers, the emergence of new or revitalized capacity, renewals during 2000 suggest there is little change from the previous years renewals. These new/revitalized markets are also seeking entry into the emerging marine product markets trying to identify new sources of growth and profitable premium flow. In short, the international cargo market will continue to produce relatively acceptable results, showing little or no sign of capacity reductions. Large premium accounts remain targeted by major international marine underwriters who continue to offer very competitive terms to maintain and expand market shares.

Hull

The US market seems to be maintaining the competitive environment that existed during 1999. Newly introduced capacity will also make it difficult for all marine insurers to maintain market share.

While underwriters proved more discerning this year on accounts where reductions were granted, the average reduction offered by US lead underwriters was slightly lower than the 1999 renewals. There are signs that the marine reinsurance market is applying pressure to move rates upwards, but with the introduction of new or revitalized capacity, competition remains the byword for the remainder of this year.

While providing less total capacity than London, the US (blue water) market is capable of providing capacity for hull risks valued at an aggregate amount of approximately US\$150 million.

The US (brown water) market, because of lower values associated with the tug and barge industry, is capable of providing capacity for hull risks valued at approximately US\$85 million.

Liability

As previously reported, the traditional marine liability risks appear sufficiently profitable to encourage both primary and excess liability underwriters to continue to expand their premium base by including general liability risks under a marine liability package placement. Reinsurance constraints that clearly differentiate between (marine) and (non-marine) risks have resulted in the creation of marine general liability forms covering historical (shore-side) risks attendant to several broad classes of maritime business.

Marine terminals, port authorities, and marinas are examples of businesses that should continue to benefit from marine liability underwriters forays over land. The US markets primary and excess marine liability capacity, afforded by a dozen established US underwriters, is approximately US\$300 million. Even with the introduction of new/additional capacity that has surfaced in the past 12 months, many leading underwriters have received management directives to hold the line on premium reductions and instead seek premium increases where appropriate and possible on accounts with good loss records.

Continental Europe

Nordic Countries

The Nordic markets of Sweden, Finland, Norway and Denmark appear to be integrating more, following a number of acquisitions, which are outlined below. There are however, differences in underwriting philosophies. For example, the Norwegian insurers have an established presence in the worldwide hull market, whereas the focus of the Danish, Swedish and Finnish insurers have been more concentrated on their own indigenous business. There are clear signs that the self-imposed national limitations are being

extended to all Nordic businesses and in certain cases, beyond that. Cargo in Scandinavia is generally written domestically, in conjunction with the property placements. Apart from one or two flagship accounts, which have had problems, it is extremely profitable.

Preliminary Estimates Of Catastrophes In Year 2000

By: - Guy Carpenter

According to preliminary estimates, economic and insured losses from natural catastrophes went down sharply in 2000, although this should not be misconstrued as an overall general downward trend of natural hazard losses. Current estimates suggest that major worldwide events throughout 2000 claimed over 17,000 lives (down from a huge fatality total of 75,000 in 1999) and caused economic losses totalling US\$ 30 billion - exclusive of indirect economic losses. As there was only one loss event that approached 7.5 as relatively low. These figures are in sharp contrast to a year ago when the cat loss experience for the industry was a huge US\$ 22 billion.

The US\$ 7.5 billion insured loss resulting from natural catastrophes was primarily the result of flooding events. Indeed current estimates suggest that floods alone accounted for US\$ 2.5

According to Munich Re the biggest single loss of the year was the flooding in Japan triggered by Typhoon Saomai in September, this caused total economic losses of more than US\$ 1.3 billion of which US\$ 925 million were covered by insurers. Although possible the only true catastrophe of the year was the floods that affected Mozambique in February and March that affected 5 million people. Despite the scale of the event total economic losses reached US\$ 160 million with only US\$ 50 million of this as insured losses.

There were several other major floods, including those affecting the Alpine area of Italy and Switzerland as well as the extensive flooding across the United Kingdom throughout October and November. Other areas to be affected by flooding were Chile, Mexico, Korea (with a total economic loss of US\$ 27 million) and Taiwan, inundated with the high rainfall associated with the passing of both Typhoons Bilis and Xangsane 8.5 billion.

The UK floods proved to be the second biggest insured loss of the year with current estimates reaching US\$ 700 million.

Although the flooding associated with the windstorms of 2000

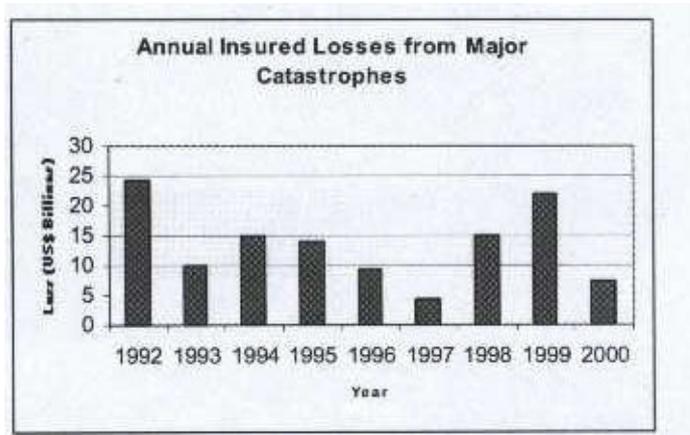
the North Atlantic hurricane season left the United States relatively unscathed with only Central America suffering any serious damage from hurricane Keith.

The largest earthquake insured loss of the year shook Tottori prefecture in Japan on October 6 th . This single event caused total economic losses of US\$ 150 million of which US\$ 20 million was covered by insurance. Other quakes were also experienced in Sulawesi, Indonesia and Southern Sumatera killing a total number of 151 people although both resulted in very low economic loss figures.

Despite the appearance of a decline in the number of catastrophes in 2000, there is no reason to speak of a long-term change in their trend. Once before, in 1997, the upward trend towards more frequent and severe natural catastrophes had been interrupted, only to continue regardless with a rise in their frequency the year after.

Table 1 below shows the annual total insured losses of catastrophes over the last few years (figures Are in US\$ billion).

Year	Losses
1992	24.4
1993	10
1994	15.1
1995	14
1996	9.3
1997	4.5
1998	15
1999	22
2000	7.5



Germany

The German marine insurance market is, similar to the industrial and commercial insurance, still under pressure. Due to partially ruinous international competition in hull insurance and domestic competition in the marine cargo insurance and professional liability insurance (carriers liability, freight forwarders liability, etc.) the results are not satisfactory. Marginal increase of premium volume on the one side and steady increase in claims on the other is the experience of the last underwriting years. This has led to internal discussions within German insurance companies as to whether marine insurance should form part of their future strategy.

Cargo

Marine cargo insurance remains an important segment contributing 46 per cent on the total marine insurance premium volume, the claim ratio has increased from 87 to nearly 90 per cent.

In 1999 the GDV, the German association of Insurers, introduced new terms and conditions for marine cargo insurance, the so-called (DTV- 2000). The new terms are a refinement of the German General Conditions of Marine Insurance and are designed to harmonize local and international standards of insurance, requirements of the shipping and finance industry as well as to decrease administration by simplified documentation.

Hull

In 1999, the leading German Blue Water Hull insurers again faced fierce international competition for German clients, but maintained considerable business in the market despite the low premium levels.

But there is also positive news. The market for leisure craft insurance (motorboats, yachts, etc.) performed well with an increase of gross premium income .

Nonetheless, it will be interesting to see how the German market develops while international competition remains strong and reinsurers produce further deteriorating results.

France

Over the past five years France has experienced dramatic consolidation amongst ten of the major insurers. As a result there are three major insurers as follows:

Prior 2000	Post 2000
Allianz ,Aticam, AGF, AXA, GAN, Groupama Reunion Europeenne, Navigation et Transport PFA and CAMAT	AGF MAT , AXA and Groupama Transport

The three groups now account for over 60% of the market with AXA and AGF MAT contributing more than 25% each, prompting an inevitable reduction in coinsurance placements.

Intense competition has continued and the development of major programmes, where marine premiums are absorbed into multi-lines programmes, has reduced the premium base. This has been compensated in the premium income figures by exchange rate changes particularly the US dollar.

Results have continued to deteriorate reflecting world trends and there is currently a concerted effort to improve the situation. The Lothar and Martin storms in December 1999 had little impact on the marine market in contrast with the non-marine side of the industry.

Hull

Overall pricing has now stabilized and there are strong endeavors to increase rates. Certain insurers have even ceased underwriting hull business for the moment.

Cargo

Price reductions have largely ceased and efforts are underway to improve the market with price increases and more attention to preventative measures.

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Dear Reader

If you have

1. Any subject for which you are looking to get more information Or
2. Want to receive this news letter on your e-mail Or
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