

# TYPHOON MAEMI

## East China Seas and South Korean Mainland



## **CIRCUMSTANCES**

Category 5 Super Typhoon "Maemi" (Maemi), or Cicada in Korean, struck the South Korean Peninsula on the evening of Friday 12 September 2003, halfway through the Chuseong 5-day holiday, dumping 453mm (18 inches) of rain and triggering massive floods and landslides. It is reported that at least 117 people have lost their lives, some 25,000 people were evacuated from their homes, and 1.4 million households were left without power. Maemi was the strongest typhoon since detailed records began 99 years ago.

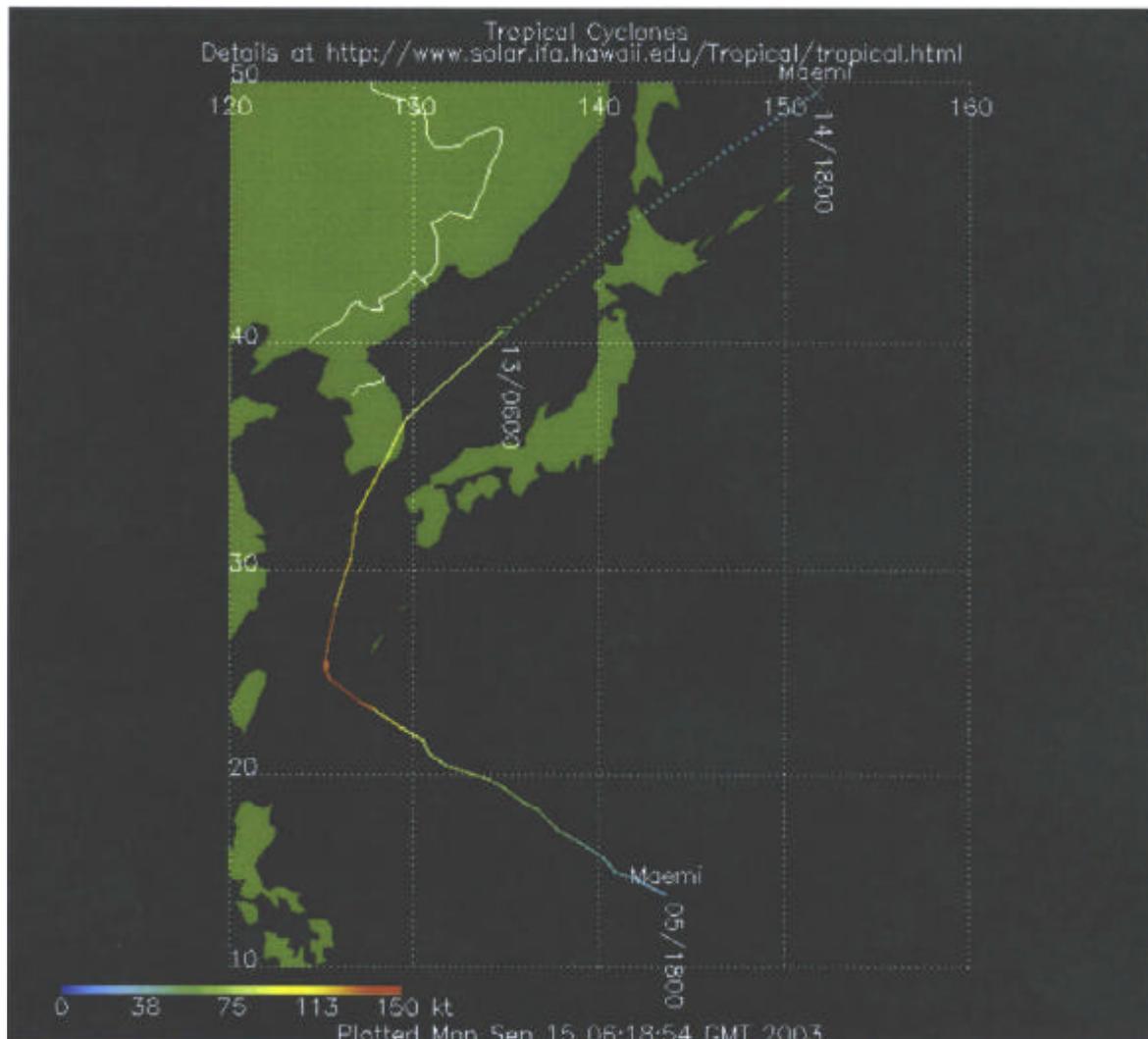
Maemi developed from the Pacific Ocean and strengthened within the East China Sea, south of Korea and east of Taiwan, and ultimately tore into the southern tip of South Korea on Friday night, carving a swathe of destruction before heading out to sea on Saturday.

Seoul's benchmark Kospi share index lost 1.8% of its value as investors worried that the effect of Maemi could disrupt trade and prolong this year's recession in Asia's third-largest economy.

Shares in Samsung Fire & Marine Insurance, South Korea's largest non-life insurer, were among the biggest losers, falling 2.3%, in anticipation of a rush of claims on damaged property and crops.

## PATH OF TYPHOON MAEMI

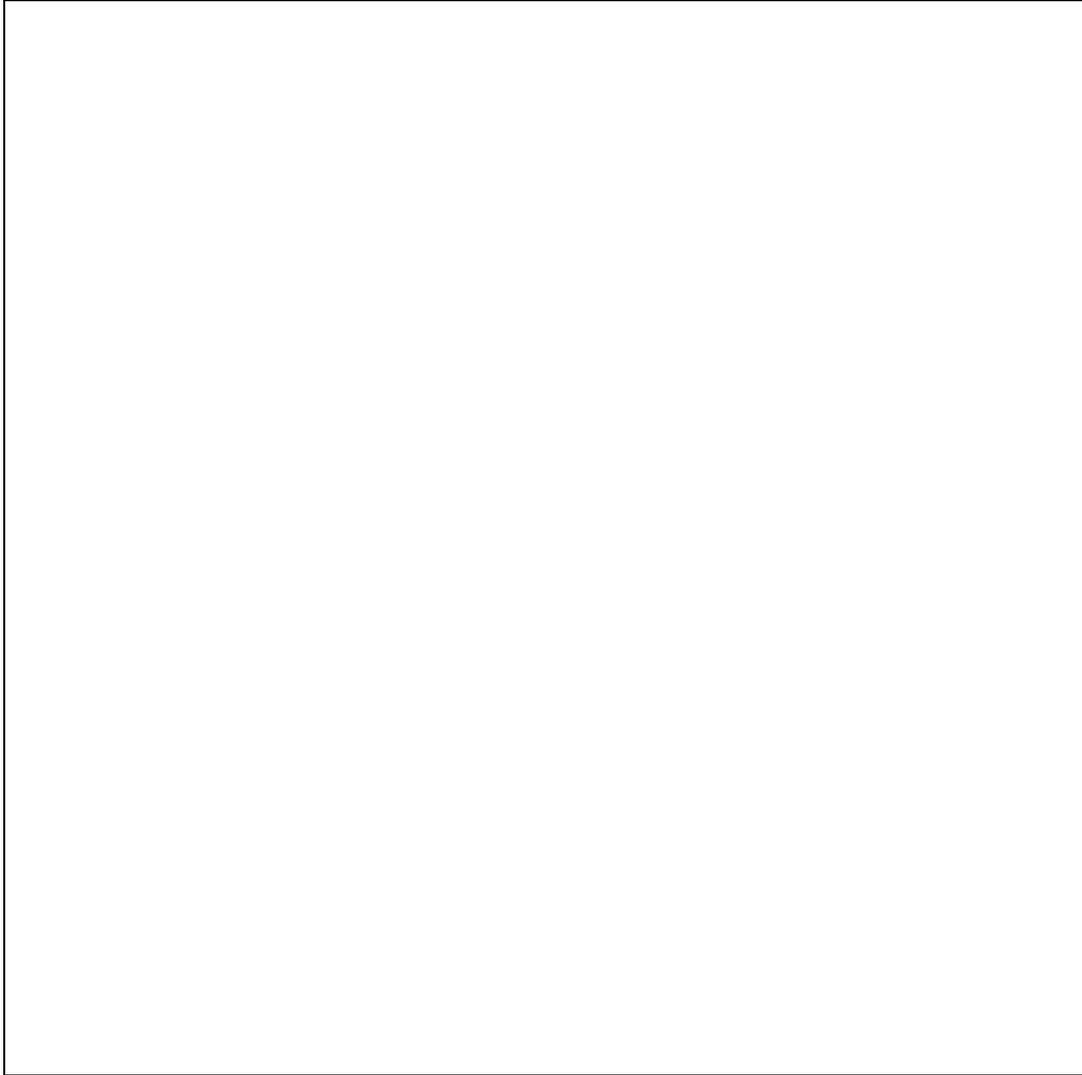
We refer to the satellite picture in Figure 1 which shows the path of Typhoon Maemi.



*Figure 1: Satellite image of Typhoon Maemi*

We also refer to the satellite photographs in Figure 2 with accompanying commentary.

## Super Typhoon Maemi



*Figure 2: Satellite photographs of Typhoon Maemi*

### **"Super Typhoon Maemi**

*The Tropical Rainfall Measuring Mission (TRMM) satellite has provided some remarkable images of Super Typhoon Maemi in the western Pacific from its organization into a minimal typhoon well east of the Philippines to its height as a super typhoon with winds over 155 mph as it was approaching the southern Ryuku Islands. During the storm's most intense phase, TRMM was able to capture the evolution of Maemi's eyewall structure as it was starting to undergo a process known as "eyewall replacement," whereby two concentric eyewalls are present before the outer eyewall collapses down to replace the original inner eyewall. This process can occur in very intense typhoons and hurricanes.*

*The first image (top two panels) was taken at 10:58 UTC on 10 September 2003, just as Maemi was approaching the southern Ryuku Islands. At that time, Maemi was classified as a Category 5 super typhoon by the Joint Typhoon Warning Center with sustained winds*

estimated at 170 mph. The left panel shows an infrared (IR) image from the TRMM Visible Infrared Scanner (VIRS). In it, Maemi appears very symmetrical with a well-defined eye and good cirrus outflow. In the right panel, rainfall rates from the TRMM Precipitation Radar (PR) and TRMM Microwave Imager (TMI), which contains the center of the storm, are overlaid on the VIRS data. Though the heaviest rainfall rates (darker reds) are located on the northwest side of the eyewall, moderate (green) to intense (darker reds) rainfall rates are contained throughout a well-defined tight inner eyewall. This inner core is surrounded by a ring of minimal rainfall rates with a broader band of moderate to intense rainfall outside of that.

The next image (lower panels) was taken almost 24 hours later at 10:02 UTC on September 11. Again the VIRS IR image (left panel) shows a symmetrical storm with an even smaller well-defined eye and a broad cirrus outflow. The rainfall structure (right panel) is now very different, however. It shows that the innermost core of rainfall associated with the original eyewall, has weakened significantly. Instead, a new second eyewall, shown by the sharp ring of moderate (green areas) to intense (darker red areas) rainfall rates further out from the center, is emerging and has contracted towards the center though ultimately it would not replace the inner the eyewall. At the time of the second images, Maemi had winds estimated at 155 mph and had just passed the southern Ryuku Islands.

TRMM is a joint mission between NASA and the Japanese space agency NASDA.

Image produced by Hal Pierce (SSAI/NASA GSFC) and caption by Steve Lang (SSAI/NASA GSFC)."

## **COUNTRY PROFILE – SOUTH KOREA**

Population:	47.7 million
Capital:	Seoul
Language:	Korean
Currency:	Won
Main Exports:	Electronic products Machinery and transport equipment
Annual Average Income:	US\$9,460

## THE DAMAGE

The key southern port of Busan took the brunt of Maemi, twisting shipyard cranes out of shape and destroying goods lined up for export on the waterfront. We provide below a brief summary of the key damage caused by this typhoon.

- At least 82 vessels sank in huge seas and fishing boats were smashed onto shore roads. The worst affected area was South Kyeongsang where at least 15 people drowned.
- Hyundai Heavy Industries, the world's largest shipbuilders, reported up to USD\$6,000,000 of damage at its Ulsan shipyard, where a 200,000 tonne off-shore oil storage facility (under construction for Exxon Mobil) toppled onto a petrochemical carrier being built for a German customer. The typhoon has also damaged two vessels being built for the oil industry
- SK Corp, South Korea's biggest oil refiner, suffered up to USD\$5,000,000 in lost production after some of its plants were temporarily shut down over the weekend because of power cuts.
- Exporters such as LG Electronics were threatened by damage to cargo handling facilities at Busan, the world's third busiest port handling a third of South Korea's exports. Several dockside cranes were torn down by the 200km per hour plus winds, reducing the port to 80% of its normal capacity. The Ministry of Maritime Affairs and Fisheries have stated that work to repair or replace the damaged equipment at Busan Port would not be finished until September 2004 because it would take two months to remove the destroyed cranes and a year to make the replacements.
- The most ravaged areas within the port are the Jaseongdae and Singamman container depots. Of Jaseongdae's twelve container cranes, two were totalled and three derailed. Singamman depot has lost six of its seven cranes, the one crane still standing is operative but it cannot accommodate ships larger than 50,000 deadweight tonnes.
- The typhoon forced four power plants to stop operations, cutting electricity to 1.4 million households as the country celebrated the Chuseong holiday.
- The average cost of damage arising from a Category 5 typhoon is USD\$5.9 Billion.

## Other Potential Damage

We refer to Figure 3 which is a map showing the distribution of China Offshore Oil and Gas Fields.



Fig 3: China Offshore Oil and Gas Fields

The path of Maemi would have taken it through the Pinghu oil and gas field which is a key field to China's natural gas development strategy. The field is located on the Continental Shelf of the East China Sea, 400km south-east of Shanghai.

The other potential fields that could have been affected are listed as follows:

- Longjing – Gas condensate field
- Tianwaitin – Oil and gas field
- Okinawa tanker terminal

## **BATEMAN CHAPMAN LIMITED - PRESENCE**

Bateman Chapman have qualified staff in the region who have considerable experience in handling losses arising from, inter alia, natural disasters, which include the devastating earthquakes that occurred in Izmit, Turkey, and Kobe, Japan.

The typhoon response team will be headed up by Mr Joe McMahon, who can be contacted on the following numbers:

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## CONCLUSION

The typhoon has been devastating with a loss of life in excess of 117 people. The Government have responded by allocating more than USD 1 Billion in disaster relief and state banks are to offer soft loan packages to help people and companies.

Financial markets have delivered a grim verdict on the cost to Asia's fourth-largest economy, which entered its first recession since the 1997-1998 financial crisis in the second quarter.

Insurers are beginning to respond to loss notifications and surveys are being undertaken, generally by local surveyors.

The personal suffering that has taken place, coupled with the difficulties of access, will make claims handling process a sensitive and time-consuming task for the time being.

We will report further as the situation develops.

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16 September 2003



*Images of the destruction caused by Maemi*