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Shock and Sadness

We at UxC wish to express our deepest sympathy for the people of Japan following the catastrophic earthquake and ensuing massive tsunami that struck the nation on Friday, March 11, 2011. Based on our direct knowledge of the Japanese people as family, friends, and business associates, we are confident that they will endure this disaster with courage and grace and, in time, recover from the effects of this tragic event. We also are optimistic that they will succeed in prudently handling the serious nuclear events triggered by the sudden, overwhelming, and nearly simultaneous natural disasters that struck the northeastern part of Honshu.

The reactor incidents in Japan are clearly something that we would rather not have to analyze but that is our job, and this is by far the largest single development to hit the market in some time. We also want to state at the outset that the full impact of these incidents is unknown so any observations offered here will necessarily be of a preliminary nature. A discussion of what has transpired so far is covered in a news brief on page 3 and will not be repeated here. The salient points are as stated below.

Three nuclear reactors (units 1, 2, and 3 of Fukushima-I in northeast Japan) have experienced loss of coolant accidents (LOCAs) and station blackouts as a result of Friday's earthquake and resulting tsunami. Primary containment of core radioactive materials is reported to be maintained, but fuel failures within the containment have occurred. The secondary containment structures for units 1 and 3 have experienced hydrogen gas explosions. As we were going to press, we learned that there was an explosion at unit 2.

Impact on Nuclear Power

In the aftermath of the accidents, countries around the world have been making pronouncements relating to the future of nuclear power. Russia's Prime Minister Vladimir Putin has said it will not affect Russia's nuclear power's program. China has made similar announcements, as have officials in South Korea. This is important since these are three of the countries that have been leading the nuclear renaissance.

On the other end of the spectrum, Germany's Chancellor Angela Merkel announced that her government intends to suspend for three months the recent new law to extend the life of that country's 17 reactors to analyze the impacts of the Japanese situation. While some of this may be related to upcoming state elections, we would not be surprised to see at least some of the reactors shut down sooner as a result of increased anti-nuclear sentiment in Germany.

We would tend to discount any statements from governments (unless they result in definitive actions like Germany's) since it is too early to know all of the ramifications from the incidents in Japan. These positions could well change over time as more information becomes available and particularly when the political reaction is fully factored in.

Obviously, this development is not good for nuclear power. It immediately impacts the level of installed nuclear capacity by the Japanese reactors taken off-line by the incident. There could be additional reactors in Japan directly affected by the incident and taken off line. Clearly, Fukushima Daiichi Units 1, 2, and 3 will be decommissioned, and other units at that site may also not be restarted. This event almost certainly will result in a delay in new reactor builds in Japan.

Other countries that could be affected by the development are those susceptible to tsunamis that are currently considering nuclear, such as Indonesia or the Philippines. These countries will likely delay, if not cancel, plans to build reactors. Other reactors planned in coastal areas, including those in China, may have to be re-evaluated or built with additional safeguards (adding to costs).

This incident could also affect the prospects for nuclear power in other countries that are not subject to the same seismic or geographical situations as Japan. Germany's moratorium is one example but obviously Germany was not an engine of nuclear growth. The question is what will happen in countries like Italy that already abandoned its nuclear program once. Italy's government has announced that it will proceed as before with plans to build new reactors; however a country-wide referendum is scheduled for June this year, and if a majority vote is reached, the country's nuclear power ban will be reestablished.

It should still be pointed out that nuclear power is too important a part of the world's energy mix to be abandoned to any appreciable degree. Oil prices are rising and recent political developments underscore the undesirability of a long-term dependence on foreign oil. Concerns about climate change raise issues with other fossil fuels and highlight nuclear's advantage in this area.

Impact on the Market

The impact on the nuclear fuel markets comes in several ways. Since this is not good news for nuclear power, there has been an almost immediate kneejerk reaction of a sell-off, both in terms of equities and the commodity, as considerable uncertainty has been interjected into the market. Frankly, we were surprised that price did not show more of a reaction on Friday. While the full scale of this incident was not known on Friday (and is still not fully known), by afternoon EDT it was known that reactors were damaged. The delayed reaction is a sign of a still immature market.

The market reacted as we would have expected today (Monday) with our daily price (the UxC BAP) experiencing by far its largest one-day drop since it was started in June 2009.

Still, despite these developments, it is the case that the market has had fairly strong fundamentals for some time now and even after a slight retrenchment after the sell-off of the most recent tranche of DOE inventory, price was again recovering. From this perspective, the news is hitting a market that has been under upward pressure for some time now, a fact that tends to mitigate the impact on price, as opposed to it occurring when the market was under general downward pressure. If this were the case, you could have seen a full capitulation.

In an odd way, the German reaction likely has the largest immediate impact from a country perspective. Germany was certainly not a factor in the nuclear renaissance, but when it passed its reactor life extension law, in a way it created new demand for the market, as German utilities had to enter the market to cover these needs. Now that Germany has suspended this law for three months (see page 4), this demand is potentially removed from the market, which has a downward impact on price.

In the short term, or until price falls sufficiently to stimulate new buying interest, recent developments will make it less likely that investors will enter the market for financial reasons as the prospects for nuclear power are not as good as before. In addition, investors are now confronted with a situation that they really do not understand, a circumstance that is not conducive to investment or speculation.

Going forward, the shutdown of reactors in Japan mean that less fuel will be consumed, possibly causing a deferral of deliveries under long-term contracts or a sale of any excess inventory that is built up. It is also possible that other reactors will be temporarily shut down for inspection or retrofitting as a result of the incident. As mentioned above, it is likely that the rate of global nuclear growth will be slowed, resulting in a slower growth of uranium demand.

However, the effects are not just limited to the demand side. Any reduction in the prospects for nuclear power expansion makes it less likely that there will be entry and investment on the production side. There could also be more consolidation on the supply side, to the extent that nuclear power growth and market prospects dim and smaller companies are less willing to take on the risk to bring properties into production. These developments would tend to place upward pressure on price.

Perspective

There are some in the industry that think the market will quickly digest this news and move on, but we think it is much more likely that this story is not going to go away for a long time. In this regard, the aftershocks of the “mediaquake” that followed the earthquake and particularly the coverage of the reactor problems in Japan will persist long after the aftershocks of the earthquake itself. We still do not know the full extent of the reactor damage as explosions continue to take place, even as this is written. For the sake of the Japanese people, we hope that all of the issues surrounding the earthquake are resolved quickly. The market, whatever its future course, will take care of itself.

Fukushima Daiichi Sequence of Events

• The fifth largest earthquake in recorded history struck in the Pacific Ocean near northeastern Japan

• Japanese nuclear reactors on the nearby coast automatically shut down as designed

• Offsite electrical power at the Fukushima-I site with six reactors was lost and this disabled the normal coolant flow through the operating reactors' coolant systems (RCSs)

• The emergency core cooling systems activated as designed, using dedicated diesel generators to supply electricity to auxiliary pumps that deliver water to the RCSs under emergency conditions

• The tsunami created by the earthquake overran the seawall surrounding the plant and flooded portions of the buildings housing the diesel generators.

• As a result of this series of events, two units experienced loss of coolant accidents (LOCAs) and the nuclear fuel was uncovered by water, causing its temperature to rise rapidly and generate steam

• The steam reacted with the fuel rod cladding material and produced hydrogen gas

• In two units (units 1 and 3), this hydrogen gas migrated to the secondary containment building and ignited, blowing off the roofs and upper sides of the buildings

• Reports indicate that the structural integrity of the primary containment structure, which houses the core's radioactive materials, has been maintained in units 1 and 3

• The second hydrogen explosion (at unit 3) knocked out emergency cooling capability at unit 2

• As we were going to press, we learned that an explosion was reported at unit 2

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