NG Leakage, Not Biogas from Sewerage, Responsible for Explosions

Dr. Md. Easir Arafat Khan

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It has been established that the explosions at Narayanganj Mosque, Moghbazar, and buildings near Science Laboratory and Siddique Bazar were not caused by explosives. It is also established that all these originated from sparks of explosive mixtures of methane gas accumulated from pipeline leakages. But the issue is that Titas Gas did not accept the responsibility in any of the cases that gas leakages from its distribution lines led to such accidents. On some occasions, gas leaked from gas lines entering sewerage lines accumulate in the confined spaces of buildings and offices. It becomes extremely difficult to find out exact reasons behind the explosion if the defaulting organization continues flatly denying the responsibility.

Dr. Md. Easir Arafat Khan, Associate Professor at the Department of Chemical Engineering of BUET, said this in an exclusive interview with ***Mollah Amzad Hossain***, Editor of Energy & Power. Dr. Easir is a Hazard and Risk Analyst and an expert of Industrial and Fire Safety Management.

Methane gas accidents have now become really alarming. What are the ways of getting rid of it?

Please note that it is important to finally identify the source and exact reasons behind any incident or accident. Preliminary investigations have indicated that sparks of accumulated methane led to explosions at the Mosque of Narayanganj, buildings at Moghbazar, Science Laboratory and Siddique Bazar. But Titas Gas Transmission and Distribution Company Limited (TGTDCL), which is responsible for gas distribution in Dhaka, disowned the responsibility. They keep on arguing that methane did not accumulate from the leakage of their distribution system. They are pointing towards gas accumulations from sewerage lines. This is not tenable. If the presence of methane is 5-15% in a gas mixture in a confined space, it will cause a major explosion coming in contact with a spark. In all cases, exactly that has happened. Hence there is no scope for TGTDCL denying the responsibility. How is it possible to recommend remedies if TGTDCL continues denying its responsibility?

Presence of accumulated methane gas is accepted as the reason behind the accidents. But the debate is over the source. TGTDCL claims that their distribution lines are not leaking. They put the blame on sewerage gas. What is your view?

Technically, if at least 3kg of methane accumulates at a confined place it can cause an explosion of the magnitude that happened at Moghbazar when the gas mixture came in contact with a spark. But after the incident, it is extremely difficult finding the source of methane leakage. Explosions may cause leakage from otherwise gas lines not leaking before. It cannot claim that investigations in the accidents are properly done now. Preparing a proper guideline for these, a committee of relevant experts should be constituted. Members must be drawn from such a committee in the investigation team when such an accident happens. Software-based simulations can be used as an aid in such investigations. That can assist in accurately establishing the cause of accidents and formulating proper recommendations for safeguarding against future similar incidents. Otherwise, the source of methane emissions cannot be established.

Most of the gas distribution lines have outlived their designed life. It may take 5-7 years to replace these. What can be the interim solution?

Media reports state of 300-400 complaints daily registered in Titas franchise areas. Around 90% of these are about gas leakage. This evidence shows how vulnerable is Titas

distribution system now. Leaking lines must be replaced as soon as possible. This must not be delayed even for a day. This must start from the most vulnerable area.

Is there any possibility of greater explosion from a mix of methane gas with biogas accumulated in confined space? It is being said that natural gas contains about 95% and biogas 70% methane. What is the exact case?

It is not true that sewerage gas can contain 70% methane. It may be even as low as 1%. The methane gas originated at sewerage lines of Dhaka is much lower. It is mixed with NH3 (Ammonia) and SO2 (Sulfur-di-oxide). In case of gas leakage from sewerage people can easily smell from the pungent odor. But methane leaked from natural gas lines may enter sewerage lines and accumulate in the confined spaces of dwelling houses and offices. These can cause explosions when they come in contact with air. I do not find any possibilities of major accidents on sewerage gas on a standalone basis.

Gas distribution companies, especially TGTDCL, acknowledge the presence of millions of unauthorized connections and thousands of kilometers of unauthorized lines in their system. They are continuously disconnecting these. But unfortunately, unscrupulous persons are reconnecting again. Knowing fully about risks of accidents the trend continues. Do you think that drives for consciousness can be a way to redress?

Illegal use of gas cannot be done without strong political backing. People knowing well about associated risks are indulged in such practice. TGTDCL or any distribution company now cannot control it without active political support. But there is no alternative now to put an end to it. There will be no way of avoiding major accidents causing huge casualties emanating from use of unspecified pipelines and fittings.

Reports of frequent accidents from use of expired CNG cylinders are being received these days. There is regulation of rechecking cylinders after every 5 years of use. But this is being ignored by the most. What can be done?

Provision of testing CNG cylinders must be strictly followed. Monitoring is not difficult at all. BRTA at the time of checking the fitness of CNG using vehicles can check this. But it cannot be guaranteed that only having proper cylinders guard against accidents. In most cases, failures of gas lines cause accidents of CNG driven automobiles. These lead to explosions of cylinders as well. All rules and norms of CNG use must be obliged during use of CNG in vehicles.

Around 70 lakh consumers are now using LPG for cooking. Accidents have also become a daily affair. The use is growing in geometric progression with time. What can the government do?

Technically, there is no scope of cylinder explosion. Liquid petroleum is filled at 6 bar (about 90 PSIG). Cylinders can withstand 100 bars. Hence cylinders cannot explode during use of LPG. The accidents are mostly taking place from use of unspecified valves as regulators and hose pipes. It is also caused by careless use. It must be kept in mind that in a confined space even 2% mix of LPG may cause an explosion. Users must be made aware of the risks in using LPG through intensive campaigning. LPG operators must do this. Government must intensively monitor. Consumers must also get fully aware about safe use at the time of purchase. Use of specified valves and hose pipes must be ensured. Media campaigning must be done intensively. Government must monitor the safe operation of the operators.

Gas law mandates use of odorant compulsory for all gas distribution utilities. TGTDCL and other utilities are reportedly ignoring this. What are your views?

Law has compulsory provision for use of specified odorant at right doses in distribution lines for safe use of gas for domestic and commercial users. Distribution utilities are going against the Law in ignoring the provision. If odorant is used regularly users can easily identify any leakage. It will be much easier to avoid frequent gas accidents.

Families of the victims can sue the distribution for violating the act provision as reasons for the death of their kin. This should be done. Utilities then will be compelled to use odorant.

Is the Department of Explosives (DOE) performing their duty properly?

DOE has not much to do about gas usage at residences. Gas law has no provision for it. But DOE lacks expertise and manpower for performing their assigned tasks.

Claims are there for introducing occupation certificates for every residential and commercial building and renewing these annually. RAJUK is reviewing it. What will you say?

There is a lot to ponder about before this is introduced. We do not think RAJUK has such qualified and trained human resources for this. This must not be another tool for harassing citizens. It can be introduced by engaging specialized private sector companies for certification. Legal framework needs formulating for this. There must be provisions for accountability if building users suffer from any failures of certificate providers.

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