Principal results of international seminar "Modern technologies in practical attempts to reduce the use, consumption, and emission of mercury by the chlor-alkali industry in Russia" which took place in Volgograd, Russia on November 16 through 17, 2005

1. The seminar was a practical action in putting into practice the UNEP resolution that is essentially aimed to form a Global partnership of states, governments, and international non-governmental organizations for the reduction of use, losses and emission of mercury into the environment by the chlor-alkali industry. There were more than 40 people participating in the seminar from the Russian Federation, the United States, Canada, Germany, France, Netherlands, Belgium, and other countries of the world. Most of the participants were experts each possessing huge experience in the aspects applicable to mercury electrolysis. Such were Messrs Reuvekamp of AKZO NOBEL, Seys and DeBell of Euro Chlor, Azizov and Sergeev of Volgograd JSC "Kaustik", Yagud of RusChlor, and Tsygankov of Cleaner Production. Other participants were representatives of various governmental bodies empowered to regulate the chlor-alkali industry. Such were Ms. Gan'shina of "Rostekhnadzor", Mr. Dyer and Ms. Barnes of US EPA, and Ms. Howland of Environment Canada. Some prominent business structures including the international ones and firms supplying the technologies and equipment also took an active interest in the seminar. Among those were the Chamber of Industry and Commerce of the Russian Federation that sent a letter of greeting signed by its Senior vice President Mr. Pastukhov to the address of the seminar and the World Bank represented by its expert at ecology Mr. Rodionov.

2. All the presentations, lectures, reports, and discussions heard at the seminar have essentially composed an evidence of the urgency of raising the task of gradual reduction of the emission of mercury by the chlor-alkali industry. At the same time it was also stressed by many at the seminar that the main reason that the mercury electrolysis had been actively in use for such a long time was that for every Russian plant it would have been so prohibitively costly and unprofitable to switch to the membrane technology that that plant could almost certainly not have made it on its own. In this connection the General director of Volgograd Joint-Stock Company "Kaustik" Mr. Azizov estimated that the payback period of a radical switch from the mercury electrolysis to the membrane technology would have been as long as 15 years for his plant, which in Mr. Azizov's view guaranteed that the mercury electrolysis would be actively exploited in Russia for a rather long time. The same conclusion was convincingly deduced by RusChlor's expert Mr. Eberil' in his fundamental report "RusClor's interpretation of the outcomes of the activities of Russian chlor-alkali producers in reducing the emission of mercury" from the analysis of both the current state and the history of Russian chlor-alkali industry.

3. Many participants pointed out that the use of mercury by the world chlor-alkali industry had recently been vastly reduced. This conclusion was convincingly proved by Ms. Howland of Environment Canada in her presentation "Overview of mercury management in Canada with a focus on chlor-alkali present and past" as well as by Messrs. Seys and DeBelle of Euro Chlor and Mr. Reüvekamp of AKZO Nobel in their respective presentations "Improvements of mercury emissions performances in the West European chlor-alkali industry" and "Experience in reducing mercury emissions". It was also acknowledged that in the last decades there had been performed a lot of quite substantial works in Russia aimed at modernizing both the whole technological process of mercury electrolysis and some of its single stages. Russian participants in the seminar proved in their addressees that those works had resulted in a substantial practical reduction in the amount of the overall loss of mercury in Russia. They further argued that that result owed mostly to the fact that Russian chlor-alkali producers had managed both to tighten substantially the general labour discipline and to heighten radically the skills and technical competence of the personnel especially in the field of operation of the equipment, its maintenance, and repairs. Among the said addresses it is especially worth mentioning the aforesaid Mr. Eberil's report and presentations made in the seminar by the representatives of the three Russian major chlor-alkali plants, namely Volgograd Public Joint-Stock Company "Kaustik", Sterlitamak Closed Joint-Stock Company "Kaustik", and Kirovo-Chepetsk Public Joint-Stock Company "Kirovo-Chepetskij Khimkombinat".

4. The seminar showed that Russian producers of chlorine had reached the level of the world's leading producers in a number of key indicators of the consumption of mercury. Among those one must first of all name the emission of mercury into the environment by the ventilation air, hydrogen, and off-gases. At the same time many experts argued that in spite of the fact that the level of the world's leading producers had been generally achieved by the majority of Russian chlor-alkali producers in reducing the amount of mercury lost to the waste waters, there still remained some persistent unsolved problems there. Those problems were said to stem mostly from the inadequate purification of the waste waters. In this connection Mr. Eberil' argued in his presentation that Volgograd Public JSC "Kaustik" lacked sharply a decent ion-exchange system for purifying the waste waters.

5. The seminar managed to point out some problems persistently existing in Russia. In particular the Russian and foreign participants agreed that the mechanical losses of mercury and the losses of mercury to the output product although having been reduced considerably were still too high as compared to the amounts of analogous losses of mercury registered in the West. This conclusion can be easily drawn from the comparison of data cited respectively in Mr. Eberil's report and reports of Messrs. Seys, DeBell, and Reüvekamp on the mercury losses of the types being considered.

6. As a positive factor the seminar acknowledged that each of the Russian chlor-alkali plants represented to the seminar had worked out its own vast and unique experience in reducing the emission of mercury into the environment, which meant that the plants could cost-effectively draw on that experience of each other.

7. The following two other results of the seminar should be also mentioned:

   - the seminar ascertained that any further progress in reducing the emission of mercury into the environment by the Russian chlor-alkali industry depends on both the future technological improvements in the productive process employing mercury electrolysis and future improvements in the so called "human factor";
   - the participants to the seminar showed equally great interest in both the exchange of experience between Russian specialists and the experience of the Western producers of chlorine especially in everything connected to either continuous monitoring of the emission of mercury into the environment through the air and water or making a mercury balance in a chlorine plant.

8. In the course of organizing the seminar the efforts of Mr. Dyer and Ms. Barnes of US EPA, Ms. Howland of Environment Canada, Mr. Azizov and Mr. Sergeev of Volgograd JSC "Kaustik" were of primary importance.

Conceptual conclusions and next steps

As a result of the seminar most participants were convinced that rather sooner than later the losses of mercury by the Russian chlor-alkali industry will be inevitably reduced to the point where they could be considered negligible. This optimism can be attributed to the fact revealed by the seminar that Russian specialists are well aware of all the modern technological approaches to controlling the use of mercury. They are also well experienced in applying these approaches to the real processes of the production of chlorine. The only real obstacle here is lack of funding.

The representatives of the Russian plants have learned that it is possible for them to draw on both the experience of each other and the experience of the West.

The organizers of the seminar assume that their intermediate objective under the aforesaid UNEP resolution should be to reach not later than December 2006 a reduction of the emission of mercury into the environment by Volgograd JSC "Kaustik" that could be measured quantitatively. For attaining the said objective, the organizers of the seminar have decided to conduct the following actions:

- Realization within December 2005 – April 2006 by Russian Centre “Cleaner Production” of its training course on the premises of Volgograd JSC “Kaustik;
- Realization by the end of February 2006 of an exchange visit of the specialists of Volgograd JSC “Kaustik” to some of the leading West European chlor-alkali plants where mercury electrolysis is still being used;
- Implementation in 2006 of a number of technological projects within the production process of Volgograd JSC “Kaustik” as a result of realization by Russian Centre “Cleaner Production” of its training course.