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Journal Title:	**Asian Journal of Physical and Chemical Sciences**
Manuscript number:	**Ms_AJOPACS_112762**
Manuscript title:	**Resizing Irrigation Pumps Used for Heap Leaching in a Mine: The SOMAIR Case**
Article type	

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PART 1: Comments on the review

	Reviewer's comment	**Author's comment** *(in agreement with the reviewer, correct the manuscript and highlight this part of the manuscript.*
Mandatory REVISION Comments **A. Is the manuscript important to the scientific community?** (Please write a few sentences about this manuscript) **B. Is the title of the article appropriate?** (If not, please suggest an alternate name) **C. Is the abstract of the article exhaustive?** **D. Are the subsections and structure of the manuscript appropriate?** **E. Do you think that the manuscript is scientifically correct?** **F. Are the links sufficient and fresh? If you have any suggestions for additional links, please indicate them in the feedback form.** **(In addition to the above-mentioned 6 points, reviewers can make additional suggestions/comments)**	**A) Yes, this article is of interest to the scientific community.** **B) The title corresponds to the content of the article.** **C) Add phrases: what is being solved in solving problems.** **D) Yes, they are appropriate** **E) To add: what is the scientific novelty, it is not fully disclosed.** **(e) With the exception *of [2]*** *Bridgwood, E. W., Singh, R. N., & Atkins, A. S. (1983). Selection and optimization of mine pumping systems. International journal of mine water, 2, 1-19.* **The rest are fresh.**	
Minor REVISION Notes **A. Is the language/English quality of the article suitable for scholarly communication?**		
Optional/General Comments	REVIEW of the article "Resizing of Irrigation Pumps used for Heap Leaching in a Mine: Case of SOMAIR" One of the main directions in the field of energy saving is associated with the development and improvement of the electric drive, which is the main consumer of electricity in industry. Currently, an electric centrifugal pump consumes about 65% of all electricity generated. For today's large industrial plants, the power losses to an electric centrifugal pump can be as high as 75% of the total losses in their power supply system. It follows that the main effect of energy saving can be obtained in the field of rational use of electric centrifugal pumps. The peer-reviewed scientific article and research carried out concerns the study and modification of the dimensions of irrigation pumps used in heap leaching at the Mines de l'Aır enterprise. (Arlit department in the Agadez region of Niger). The main method of processing such raw materials is heap leaching, which causes problems due to the presence of dispersed particles in the ore. There are various ways to intensify the leaching process, which are expensive and difficult to use. Leaching using sulphuric acid solutions is the most widely used process for extracting uranium from uraninite ores due to the relatively low cost and wide availability of the acid. The analysed results of the study are described and are as follows: the operating pump directs the liquid to the desired heap height with a pressure of 0.5 bar, while the desired pressure for irrigation is about 2 bar. At the same time, the researcher describes his results as follows: a drop in uranium juice production, the pump does not show cavitation, since the NPSHD is 4.71 m, which is much higher than the NPSHr, which is 1.44 m. Given that at 1485 rpm the pump is not able to produce a pressure of 6 bar with the valve closed, in this case this pump loses its performance. To meet the challenges, by processing low-yield ores with the system described in the paper, SOMAIR achieves a significant increase in production and constantly changes the size and optimizes its capacity. This solution could be decided to choose different pump sizes and combine them for heap irrigation in heap leaching stage. Here we can agree with the author, this is a better	

	option, problem solving. It should be noted that the head varies depending on the flow rate and is represented by the characteristic curve H = f(Q) for the pump in question, that the author compares it with the manufacturer's passport data. However, there is a head of any pump, the energy released by the pump per unit mass of the fluid flowing through it, for these cases the author, using Bernoulli's theorem, determines the HMT between two points in the circuit containing the pump. When determining the operating point of the pump, the pressure drop ΔH of the hydraulic circuit is proportional Q^2, the curve Hr = f(Q) of the hydraulic circuit is parabolic. The operating point, as shown in Figure 1 (see Figure 1), defines the intersection of two characteristic curves: the resistance Hr = f(Q) of the circuit and the load H = f(Q) of the pump, as specified by the manufacturer. However, the figure shows the point of intersection, but their calculations, i.e. The technical indicators do not show, and it is somewhat unclear whether instead of choosing a pump model, the author chooses the operating speed? Of course, the author had to conduct mathematical modeling, and then based on its results, it would be possible to choose the working speed. The author's version does not contradict the existing methodology. As for the procedure of connecting 3 pumps in parallel, 2 of them work simultaneously, and the third as a backup, here we can also agree with this decision of the author. To test the validity of these pumps and the configuration of the plant, they are placed in the most adverse operating conditions, having tested them in the most difficult operating conditions. From there, the researchers check the performance of the pumps under study in order to determine whether the selected pumps are able to transport the liquid (juice for irrigation) to the discharge point under a certain pressure under optimal operating conditions, showing them in the figure the current pumping scheme of stage 3, as well as the results of measurements of the circuit characteristics. From the characteristics of the third stage pump circuit, the following conclusions can be drawn: the HMT (33.58 m) is lower than the pump (34.03 m), so this pump directs the fluid to the desired pile height at a pressure of 0.5 bar, while the pressure required for irrigation is about 2 bar. If we take into account that at 1485 rpm the pumps lose performance because they cannot provide a pressure of 6 bar with the valves closed. In stage 3, the HMT of the circuit is equal to the HMT of the pumps, so the pumps can still pump fluid into the pile, but the pressure is so low that the flow rate does not exceed 150 m3/h even when two pumps are running at the same time. Based on the analysis of the studies performed, the results obtained on the basis of engineering calculations, it can be stated that the researchers solve the problem on the basis of the set goal. The main results are as follows: With an efficiency of 61.98%, the NPSHD is significantly higher than the NPSHRr, which means that the pump operates under optimal conditions and does not experience cavitation. In the fourth stage circuit, the CPKN 100-404 pump, driven at 1650 rpm, provides a flow rate of 175 m3/h and a head of 57.91 M.C.E. The MegaCPK 125-80-380 pump, driven at 1750 rpm, provides a flow rate of 190 m3/h and a head of 60.28 M.C.E. The CPKN 100-404 pump, driven at 1450 rpm, provides a flow rate of 175 m3/h and a head of 57.91 M.C.E. The CPKN 100-404 pump, driven at 1650 rpm, provides a flow rate of 175 m3/h and a head of 57.91 M.C.E. The MegaCPK 125-80-380 pump, driven at 1450 rpm, provides a flow rate of 175 m3/h and a head of 60.28 M.C.E. The CPKN 150-440 pump, driven at 1450 rpm, provides a flow rate of 230 m3/h and a head of 67.55 M.C.E. The MegaCPK 150-125-380 pump, driven at 1750 rpm, provides a flow rate of 250 m3/h and a head of 71.71M.C.E. The CPKN 150-440 pump, driven at 1450 rpm, provides a flow rate of 230 m3/h and a head of 67.55 M.C.E. The CPKN 150-440 pump, driven at 1450 rpm, provides a flow rate of 250 m3/h and a head of 71.71 M.C.E. The pumps offered by the authors of the options are the most efficient, when installed two pumps in parallel, one for leaching and the other in standby mode. Summing up, the following recommendations and conclusions can be drawn:	

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	1. The problem of introducing modern energy-saving technologies based on the use of changing the size of irrigation pumps used in heap leaching can be solved by mathematical modeling of the hydrodynamic system "receiving well - pumping unit - pipeline system" and developing fundamentally new methods for determining the optimal parameters of the pumping unit and ways to control it. 2. Modern problems of analysis of the efficiency of the selection of pumping equipment and control methods can be solved with the use of modern information technologies and special computer programs. In the future, I recommend researchers to use information technologies with the use of computer programs in their research. 3. The peer-reviewed article "Changing the Dimensions of Irrigation Pumps Used for Heap Leaching in a Mine: The Case of SOMAIR" meets all the requirements of the scientific publication, the results are presented using engineering and theoretical calculations of the relevant indicators. 4. **Note:** the annotation shows the solution to this problem. After the words: The aim here is to check the current pumps, integrate the new parameters and choose the right pumps, either by keeping to the current standard or by proposing other, more efficient types of pump. From the beginning of the paragraph, add: a scientific approach to solving the problem. 5. I consider the peer-reviewed article to be positive, and it can be recommended for publication in journal publications.	

PART 2:

	Reviewer's comment	**Author's comment***(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	

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