



Dr. A. P. J. ABDUL KALAM TECHNICAL UNIVERSITY
(Formerly UP Technical University)
Sector-11, Jankipuram Vistar Yojna, Lucknow-226031



Ref: AKTU/DeanPGSR/2021/hackathon-1

Date: 06.05.2021

To,
The Directors/ Principals,
All affiliated/Constituent Engineering colleges,
Dr. A.P.J. Abdul Kalam Technical University,
Uttar Pradesh, Lucknow

Subject: Regarding Hackathon on Oxygen wastage/leakage/losses in hospitals of Uttar Pradesh.

Dear Sir/Madam,

You all are aware that in prevailing COVID-19 pandemic, the concerned agencies/industry of the Nation are making extreme efforts in providing the required amount of medical oxygen in hospitals. Moreover, wastage or leakage of oxygen in hospitals may enhance the challenges in the present situation. In this critical situation we have to think of minimizing the wastage/leakage and misuse of oxygen at all levels and ensures the best utilization of available oxygen for patients.

In view of this, Dr. APJ Abdul Kalam Technical University, Lucknow is organizing a Hackathon to explore some technology based solutions to prevent the Oxygen wastage/leakage/losses in hospitals in India, especially in the state of Uttar Pradesh, so that the available oxygen can be utilized in the best way to support the patients in the hospitals. Therefore, the innovative ideas are invited from students, researchers and faculty members as per attached problem statements (Please refer Annexure 1).

In this regard you are requested to encourage students, researchers and faculty members for participation through below Google form link latest by **10 May 2021, 5:00 PM.**

<https://forms.gle/D4nTuf54PsvRrGxC7>

Best ideas will be acknowledged and will be awarded by token of appreciation.

For any query please write to Dr. Anuj Kumar Sharma on anujksharma@cas.res.in mentioning the subject "Queries regarding oxygen hackathon May 2021" or call Mr. Abhishake Nandan on 8707728907.

With warm regards,

Yours Sincerely,

(Prof. M.K. Dutta)

Director, Centre for Advanced Studies
Dean PGSR, AKTU Lucknow

Copy for information and necessary action to:

1. Registrar, AKTU for information please
2. Finance Officer, AKTU for information please
3. All Deans, AKTU Lucknow
4. Media Incharge, AKTU Lucknow
5. Staff officer, Hon'ble Vice Chancellor for kind information to Hon'ble Vice Chancellor

(Prof. M.K. Dutta)

Director Centre for Advanced Studies
Dean PGSR, AKTU Lucknow

Few problems related to Oxygen leakage/wastage/losses in hospitals

PS 1) Transfer of liquid medical oxygen (LMO) from capsule (Mobile tank) to tanks installed in hospitals. During transfer of LMO to many tanks installed in hospital, the hose pipe (connecting hose) is connected to input of tanks and transfer of LMO is done. Thereafter, the connection is removed and connected to another tank, then one after another. During the engagement and disengagement of connection pipe every time, the leakage is happened. Some mechanism can be designed to avoid the loss of oxygen during transfer of LMO to tanks.

PS 2) The oxygen is supplied to the beds in hospitals through central supply system, in which the cylinders are centrally installed at one place in the hospital. From there oxygen is supplied to the beds through pipeline. The leakage may occur at the manifolds where the cylinders are connected. Some mechanism/solution can be designed to minimise the oxygen leakage.

PS 3) The leakage of oxygen in the pipe lines can be occurred and generally it is not monitored automatically. If minor leakages are occurring at any location, then it is not physically or visually observable. Some mechanism/system can be designed to observe or find out the leakage in the pipe lines.

PS 4) Loss of oxygen due to sudden transfer of patient to another bed or location due to his/her death or some other reasons. During the sudden transfer, sometimes, due to staff negligence or in hurry, the valve of oxygen mask is remained open unknowingly. The loss of oxygen is occurred due to unattended/unused mask during the unavailability of patient on bed. Some mechanism can be designed to avoid the loss of oxygen in this regard.

PS 5) Generally, more than 50% patients are being treated on simple oxygen mask, in which the flow is generally kept at 2-10 litres per minute. Sometimes patients or their companions get irritated and ask the nursing staff to increase the flow rate of oxygen to maximum though the lower supply is sufficient. This is one of the major causes of wastage of oxygen in the hospitals. Some solution can be proposed in this regard.

PS 6) Sometimes due to improper fixing of oxygen mask on face, the oxygen is not properly utilized to support the patient need. If the mask is not properly fixed on face, some amount of oxygen is not inhaled by the patient and it is gone as waste. To compensate the need of patient, the flow rate of oxygen is increased which further increases the wastage of oxygen. Some solution can be proposed in this regard.

Participants are advised to choose a problem statement from above or share their own observed problems (in addition the above mentioned) on Google Form. Innovative technological ideas and solutions are invited to address these problems.