Action Taken Report: Examination of the Pollution Under Control (PUC) system as submitted by the Union Government on December 2, 2016 to the Hon'ble Supreme Court and recommendations to improve compliance, enforcement and effectiveness of the system

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As directed by the Hon'ble Supreme Court, in its order of December 2, 2016

The order of the Hon'ble Supreme Court dated December 02, 2016 has directed the following:

"We had by our order dated 25.11.2016 asked the Government to answer a few queries set out in the said order in regard to what is the system of issuing "Pollution Under Control Certificate" (PUC) to vehicle owners and as to who licenses the centres where such pollution checks are carried out. Mr Ranjit Kumar, learned SG has today filed his response to the said queries and explained the position at some length. We request Ms Sunita Narayan to examine the reply to the queries filed by Mr Ranjit Kumar and to file her response to the same along with her suggestions if any for improvement of the prevalent system."

This note is submitted in compliance with this direction and seeks to suggest the improvements that are needed in the current PUC system to make it effective to check the pollution from vehicles that are on-road.

1. Highlights of the submission on PUC from the SG

The Solicitor General has furnished the following details related to enforcement of the PUC programme:

i. System of issuing pollution under control certificates to vehicle owners and who licenses the centres where

such pollution checks are carried out and certificates issued in form of stickers.

It is noted that PUC certificates are issued as per the Rules 115 of the Central Motor Vehicle Rules, 1989. Detail of the test procedures for smoke density test for diesel vehicles is given. It is further stated that test results are transferred to the central server and readings are displayed on the computer screen after the completion of the test. This prohibits human intervention. Transport Department GNCTD grants licenses to authorised PUC centres. Delhi Transport Infrastructure Development Corporation Ltd issues numbered hologram to stick on PUC certificates.

For compliance there is a proposal of the High Powered Committee under the Lt Governor of Delhi to implement 'No PUC No Fuel programme'. This has not been implemented. Moreover, South Delhi Municipal Corporation is going to introduce RFID system with cameras linked with PUC data base and registration data base to enable enforcement.

ii. How the PUC Centres are licensed, monitored and by whom?

It has been stated that the PUC centres are authorised by the Transport Department of NCT Delhi as per the terms and conditions detailed out in the submission. The Automotive Research Association of India under Rule 126 of CMVR has prescribed the code of practice. It is claimed that routine inspection of PUC centres is carried out. For example, between March 4-23, 2016 about 118 PUC centres have been inspected.

iii. How many licenses have been cancelled on account of Centres not performing their duties satisfactorily?

It is noted that the total number of PUC centres in NCT Delhi are 962. The result of inspection of the centres has been given. Between July 2013 and October 2016, license of 42 centres have

been suspended and 14 cancelled. Show cause notice has been served on 175 centres.

iv. What steps, if any, can be taken to check vehicular pollution randomly either through transport department or motor vehicle/traffic department concerned?

The process of enforcement through challan and the basis of challan under the specific provision of law have been detailed out. The numbers of challans have also been furnished

v. Whether the pollution checking centres are computerised and whether data available to it is uploaded on in the Internet? If so, which is the agency that monitors the entire process?

It is noted that the checking centres are computerised and linked with the central server on real time basis. The network is carried and maintained by Delhi E Governance Society, IT Department GNCTD. The data is available on NIC website.

2. Observations on the note submitted by SG

The details on PUC as submitted by the SG does not adequately bring out the effectiveness of the programme in terms of:

i) The overall level of compliance with the programme: The submission has not mentioned the current level of compliance by private or public vehicles to PUC and steps that will be taken to ensure that all in-use vehicles are checked for pollution.

ii) The effectiveness of PUC to identify and weed out grossly polluting vehicles. The data submitted by the

Union does not represent the full information on current rate of failure and pass based on PUC norms.

iii) The adequacy of the current norms and test procedures in addressing emissions from modern vehicles especially diesel vehicles

We believe that the effctiveness of the programme can be compromised If these issues are not addressed.

From this perspective we are making the following recommendations

3. Recommendations for improvements/system changes in the current PUC system so that it is effective to check the pollution on in-use vehicles

1. The need to ensure 100% compliance by linking PUC certification with motor vehicle insurance

The current enforcement stratgey based on on-road checking and challan does not ensure 100 per cent compliance with the programme i.e. ensuring all vehicles turn up for tests and obtain certificates.

It is therfore recommended that annual vehicle insurance scheme, which is mandatory for all vehicles must be linked with valid PUC certificate. All vehicles have to obtain insurance as there is very stringent penalty involved including imprisonment under the Motor Vehicle Act 1988 (Motor Vehicle Act 146/ 196). For commercial vehicles driving without fitness certificate is also punishable (56/192 M.V. Act).

At the time of obtaining insurance, the insurance authorities should be able to verify the latest valid PUC certificate from the RTO with the registration number of the vehicle, post which the insurance will be advanced / renewed for the vehicle. Also an

annual charge for road fitness should be paid by vehicle owners, which will make the system operational.

No major changes need to be made in the laws/acts that govern the insurance companies or the MV Insurance. This will require a small amendment in the already existing clauses in the policy documents of the insurance companies. This should clearly define the PUC clause. This needs to be done by the Motor Tariff authority of the Insurance Regulatory and Development Authority (IRDA) which already provides a set of six guidelines to be followed by each insurance company pertaining to the MV insurance.

Ministry of Road Transport and Highways may be directed to implement this strategy.

2. Amend the PUC norms to make them stringent and improve effectiveness

2.1. Diesel vehicles:

The submission from the Government has not highlighted how weak the PUC norms are for pre-Bharat Stage IV vehicles. It has not given the failure rate in vehicles. As the PUC data is not publicly available it is not possible to assess the failure rate. ***However, assessment in the past has shown that these norms are so lax that they can barely fail any vehicle.***
Globally it is established that in-use emissions norms should be fixed in such a manner that at least 20 percent of the most polluting vehicles on roads can be identified and repaired for maximum impact.

For all diesel vehicles – old and new -- there is only one test.
This checks the smoke density based on free acceleration – how black is the smoke as emitted from the tailpipe. This norm for all pre-Bharat Stage (BS) IV vehicles is 65 Hartridge Smoke Units (HSU) (measure for density of smoke). For BS IV vehicles it has been tightened to 50 HSU. Most leading Asian countries like

Singapore and Malaysia have already tightened the smoke density limit to 50 HSU for all diesel vehicles of all vintage. It is as low as 45 HSU in Thailand.

In fact, a diagnostic survey carried out in 2012 showed only 2 per cent failure rates in diesel cars and no failure in commercial vehicles.

Moreover, it may be noted that the current smoke density tests is archaic and is not a good proxy for measuring particulate matter emissions. With improvement in diesel technology, black smoke is not visible, but particles become finer and more invisible. This cannot be controlled through smoke density tests. Globally, steps are being taken to make this test more rigorous by carrying out these tests on chassis dynamometer as in Hong Kong and China. India needs to take similar steps and phase in these tests for diesel commercial vehicles and SUVs on a priority basis.

The centralized vehicle inspection centre at Burari and another new centre that is coming up in Delhi should be equipped to carry out advance diesel testing. Snap idle test on chassis dynamometer should be introduced. Ministry of Road Transport and Highways should be directed to examine this matter and take action.

2.2. Petrol vehicles:

Norms for petrol vehicles are more stratified. In petrol vehicles both carbon monoxide and hydrocarbon concentration in exhaust are measured. The norms are graded according to vintage – pre BSII; BSII and BSIII; and BSIV vehicles. Similarly, graded norms are in force for two wheelers.

The problem here is that the norms for pre-BSIV petrol vehicles are very weak and barely fail any vehicles. A rapid diagnostic analysis of vehicles tested during the month of March 2012 in Delhi showed not only very dismal failure rate but also a

wide margin between the norms and the actual emissions levels found in most vehicles. Nearly all vehicles pass and a mere 2-to 4 per cent vehicles fail.

This requires immediate tightening of norms for pre-BSIV vehicles. Without this and only sprucing up the system for enforcement will not deliver.

In addition, there is lambda test (air to fuel ratio) for petrol cars fitted with three way catalytic converters. This test is done to ensure the proper working of optimal conditions needed for catalytic converters to perform efficiently. This tests needs to be used for compliance.

3. The need to integrate On-board Diagnostic System (OBD) with PUC in-use emissions testing

Given the rapid advancement in vehicle technology and emissions control systems it is now time to go beyond PUC programme and introduce more advanced system of inspection. It may be noted that the Ministry of Road Transport and Highways has already mandated on-board diagnostic system (OBD) in vehicles. These systems are inbuilt in the vehicle that records the emissions performance of the vehicles on road. If this information is verified at the time of PUC certification significant scrutiny of emissions performance is possible. This will also help to identify the kind of repair that is needed. This opens up new opportunities to monitor emission performance of vehicles while on roads.

OBD-I is mandated from April 2010, and OBD-II is mandated from April 2013 for BS IV vehicles. OBD-I test are discontinuity tests this requires that malfunction indicator light (MIL) must be activated if discontinuity of emission related components occur.

OBD-II requires the MIL light must be activated if emission related components cause emission to exceed OBD threshold (emission limits for CO, HC, NOx and PM in gram per km).

OBD checks will require scanning tools as data acquisition device. OBD checks are faster and simple than emission testing. This screening system will reduce number of test carried out annually and will screen out polluting vehicle which can be taken for proper repair.

This system needs to be formally integrated with the emissions inspection. This will significantly upgrade the inspection system and minimize manual errors and interference. It may be noted that Euro VI vehicles will require portable emissions monitoring (PEMS). This is a significantly advanced system in which vehicles will be monitored as they move on the road.

Therefore, Ministry of Road Transport and Highways be directed to frame to the implementation strategy along with the transport departments in the NCR to integrate OBD with emissions inspection for all BS-IV vehicles that are equipped with OBDII.

4. Urgent need to strengthen centralised inspection centres for commercial vehicles and SUVs

On a priority basis the centralised inspection centres for commercial vehicle like that in Burari need be upgraded and automated for advanced emissions inspection of commercial vehicles and SUVs.

It is also noted that the large number of decentralised PUC centres – as high as 962 centres – are difficult to monitor and audit on a regular basis. Ideally their numbers should be reduced over time and sizeable number of priority segments like diesel vehicles should be tested in advanced centralised centres. In the

meantime, it is recommended that monthly report on auditing of PUC centres be submitted.

5. Make the PUC data available for remote auditing

Solicitor General has submitted the checking centres are computerised and linked with the central server on real time basis. The data is available on NIC website.
It may be noted that the actual results of emissions testing is not accessible and that makes assessment of actual emissions performance of the fleet difficult. It is recommended that the database of centralised server be used for remote auditing of PUC centres to track credibility of testing and performance of the PUC centres.

Annex 1:

Table: PUC norms for different categories of vehicles

For Diesel Vehicles		
	Maximum Smoke Density	
	Light absorption coefficient (1/metre)	Hartidge Units (HSU)
Pre-Bharat Stage IV compliant vehicles	2.45	65
For Bharat Stage IV compliant vehicles	1.62	50

For Petrol Vehicles
CO and HC levels in Pre 2000 two wheelers

2&3-Wheelers (2/4-stroke)	CO in %	HC in ppm
Vehicles manufactured on and before 31st March, 2000	4.5	9000
CO and HC levels in Post 2000 two wheelers		
2&3-Wheelers	CO in %	HC in ppm
(2-stroke)(Vehicles manufactured after 31st March,2000)	3.5	6000
(4-stroke)(Vehicles manufactured after 31st March,2000)	3.5	4500
CO and HC levels in Pre BS II cars		
4-wheelers	CO in %	HC in ppm
Manufactured as per pre Bharat stage-II norms	3.0	1500 *
CO and HC levels in BS II, BS III cars		
4- wheelers	CO in %	HC in ppm
Manufactured as per BS-II, BS-III or subsequent norms	0.5	750
Note: * For CNG vehicles non methane hydrocarbon = 0.3 X HC; For LPG vehicles Reactive hydrocarbon = 0.5 X HC		
CO and HC levels in BS IV cars		
4- wheelers	CO in %	HC in ppm
Petrol four wheelers *	Idle CO = 0.3 volume % High idle CO = 0.2 volume %	Idle HC = 200 ppm
CNG/LPG four wheelers	Idle CO = 0.3 volume %	Idle HC = 200 ppm
Note: * Lambda test to be conducted at High idle at 2500 +/-200 rpm (engine rotation per minute), Lambda cut-point 1+/-0.03 or as declared by vehicle manufacturer		