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Vice President
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December 19, 2001

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: **Docket Nos. 50-361 and 50-362**
60-Day Report
Licensee Event Report No. 2001-003
San Onofre Nuclear Generating Station, Units 2 and 3

Gentlemen:

This submittal provides a 60-day Licensee Event Report (LER) in accordance with 10CFR50.73(a)(2)(i)(B) describing two separate operations prohibited by the plant's Technical Specifications. The two events, while separated in time, had the same apparent cause and involved the same system, the Control Room Emergency Cleanup System (CREACUS). The earlier event was determined to be an operation prohibited by the plant's Technical Specifications while investigating the more recent event. Consequently, a single report is being provided for both events. Neither the health nor the safety of plant personnel or the public was affected by either occurrence.

Any actions listed are intended to ensure continued compliance with existing commitments as discussed in applicable licensing documents; this LER contains no new commitments. If you require any additional information, please so advise.

Sincerely,

LER No. 2001-003

cc: E. W. Merschoff, Regional Administrator, NRC Region IV
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 & 3

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NRC FORM 366 (MMM-YYYY) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

APPROVED BY OMB NO. 3150-0104 EXPIRES MM/DD/YYYY

Estimated burden per response to comply with this mandatory information collection request 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the information and Records Management Branch (T-6 F33) U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If a document used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, Information collection.

FACILITY NAME (1)	Docket Number (2)	Page (3)
San Onofre Nuclear Generating Station (SONGS) Unit 2	05000-361	1 of 9

TITLE (4): One Train of CREACUS Inoperable Due To Unlatched Circuit Board

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									SONGS Unit 3	05000-362
10	22	2001	2001	-- 003 --	00	12	19	2001	FACILITY NAME	DOCKET NUMBER

OPERATING MODE	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check One or More) (11)									
(9) POWER LEVEL	100		20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)		
(10)			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)		
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71		
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER		
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A		
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)				

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
R.W. Krieger, Vice President, Nuclear Generation	949-368-6255

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	Yes (If yes, complete EXPECTED SUBMISSION DATE)	X	No				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-spaced typewritten lines (16)

At 2020 PDT on October 22, 2001, a control room operator while making his rounds discovered the CREACUS Train B flow control system was inoperable (indicated flow upscale while system shutdown). SCE determined the flow-indicating controller (and CREACUS Train B) had been inoperable from the time the Train B recorder paper was last changed (October 4, 2001). Because Unit 2 increased Mode during this period (an action prohibited by the Tech Specs), this condition is being reported in accordance with 10CFR50.73(a)(2)(i)(B).

The cause of the failure was a dislodged circuit board in the Train B flow recorder (Westinghouse Veritrak Model 75RE2010). SCE concluded the flow recorder's service module was likely inadvertently unlatched when the recorder paper was last changed on October 4, 2001.

The dislodged card was immediately reseated. As an interim action while reviewing and implementing long term corrective actions, an independent verification that the service module is properly latched will be required following each recorder paper change.

These conditions would not have impacted the ability of the control room operators to take appropriate accident mitigation actions. SCE concludes that there is no increase in calculated Core Damage Frequency or Large Early Release Frequency.

Plant: San Onofre Nuclear Generating Station, Units 2 and 3
Discovery Date: October 22, 2001

	Unit 2	Unit 3
Reactor Vendor	Combustion Engineering	Combustion Engineering
Mode	1 - power operation	1 - power operation
Power (percent)	99.9	99.9

Background:

The Control Room Emergency Air Cleanup System (CREACUS)(VI) provides a protected environment where operators can control the plant following an uncontrolled release of radioactivity, toxic gases, or smoke. CREACUS consists of two independent and redundant trains, A and B. Each train consists of an emergency air conditioning unit (ACU), an emergency ventilation air supply unit (VLR), emergency isolation dampers (DMP), cooling coils and two cabinet coolers. Because the control room (CR) is common to both units, CREACUS is a shared system.

There are two CREACUS operational modes (see Figure 1):

1. The emergency mode, initiated by the control room isolation signal (CRIS), isolates the control room to protect personnel from radioactive exposure.

   In the emergency mode, the intake and exhaust dampers are closed and control room air is recirculated. The emergency ventilation supply unit provides filtered makeup air (from the outside) to the control room to maintain the control room slightly pressurized (at least 0.125 inches water gauge) with respect to the adjoining areas to prevent infiltration of unfiltered air. Filtered outside air replaces air that leaks from the pressurized control room envelope.

   A flow controller (flow element, transmitter, controller and recorder) controls inlet damper position to maintain the desired makeup flow rate. If the flow controller fails "high," the makeup damper closes, decreasing air flow to the control room. Loss of makeup air could result in the loss of control room pressurization.

2. The isolation mode, initiated by the toxic gas isolation signal (TGIS), isolates the control room to protect personnel from toxic gases and smoke. TGIS is designed to automatically terminate the supply of outside air to the control room and to initiate operation of the emergency HVAC system to minimize operator exposure, if a toxic hazard is detected. Normal ventilation can be reinitiated only by manual action of the control room operator after the system has been reset.

For a CREACUS train to be considered operable, associated dampers within the system must be operable. Failure of a train's flow controller can cause outside air inlet damper to misposition, compromising the CREACUS safety function, and making the train inoperable.

Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.11 requires two trains of CREACUS to be operable in Modes 1 through 6 (Applicability).

- With one train of CREACUS inoperable in Modes 1 or 2, TS 3.7.11 Action A. required the train be made operable within 7 days. (Note that TS 3.7.11 Action A. was revised, effective October 24, 2001, to allow 14 days.) If Action A. is not met, Action C. requires the unit be placed in Mode 3 within 6 hours and Mode 5 within 36 hours.

- With both trains of CREACUS inoperable (for reasons other than the control room boundary inoperable) in Modes 1, 2, 3, or 4, TS 3.7.11 Action F. requires immediate entry into TS 3.0.3.

- With one train of CREACUS inoperable in Modes 5 or 6, TS 3.7.11 Action D. requires the operable train be placed into service immediately, or core alterations and irradiated fuel movements suspended.

- When an LCO is not met, TS 3.0.4 prohibits, with a few exceptions, entry into a mode in the TS LCO Applicability.

Description of the Event:

At 2020 PDT on October 22, 2001 (discovery date), a control room operator while making his rounds (utility, licensed) discovered the CREACUS Train B flow control system was inoperable (indicated flow upscale while system shutdown) (AR011001218). SCE's investigation determined the flow-indicating controller (and CREACUS Train B) had been inoperable from the time the Train B recorder paper was last changed (October 4, 2001).

Consequently, this condition is being reported in accordance with 10CFR50.73(a)(2)(i)(B) because:

1. At 1451 PDT on October 20, 2001, during startup following a planned maintenance outage, Unit 2 entered Mode 4 (from Mode 5), and reached Mode 1 at 1605 PDT on October 22, 2001. TS 3.0.4 and TS 3.7.11 Action D. prohibit these mode changes and associated core alterations (i.e., reactivity changes), Action D.

2. During the approximate 18 days CREACUS Train B was inoperable, Unit 3 was operating in Mode 1. That period of time exceeded the TS 3.7.11 Action A. limit of 7 days.

3. During the approximate 18 days CREACUS Train B was inoperable, CREACUS Train A was taken out of service for maintenance on October 11, 2001 for about 24 hours, and October 18, 2001 about 6 hours. Both of these events caused Unit 3 to unknowingly enter TS 3.0.3.

Cause of the Event:

The cause of the failure was determined to be a dislodged circuit board in the Train B flow recorder (Westinghouse Veritrak Model 75RE2010). When dislodged (neither fully inserted nor fully removed), the power supplies to different pins on the card can become mixed, causing controller and/or indicator failures. SCE reviewed the recorder's paper record and determined the associated controller failed "high" at about 0645 PDT on the discovery date (October 22, 2001). The dislodged circuit board caused the indicated train air flow rate to go to 100 percent. If the CREACUS train were operating, the flow control system, sensing the erroneous high flow, would close the makeup flow control damper to reduce flow to

match demand. The closed damper would result in the actual flow being reduced to zero, potentially losing the control room pressurization function.

SCE's investigation concluded the flow recorder's service module was likely inadvertently unlatched when the recorder paper was last changed on October 4, 2001. The latch sits at the bottom of the recorder chassis below the recorder paper. See Figures 2, 3 and 4. While changing the paper, the latch securing the service module containing the circuit board can be accidentally released. Because the service module must be latched to be seismically qualified, SCE conservatively declared Train B inoperable from October 4, 2001 to the discovery date even though recorder and controller were functioning normally until 0645 on October 22, 2001.

Corrective Actions:

- The dislodged card was immediately reseated, bringing both units into full compliance with TS LCO 3.7.11.
- SCE provided a Priority Reading Assignment for operators that specifically addressed the latching mechanism and alerting them to this problem. The priority reading also specified how to detect an unlatched service module when changing the recorder paper and how to detect a non-functioning controller when marking the recorder's paper during daily rounds.
- As an interim action while reviewing and implementing long term corrective actions, an independent verification that the service module is properly latched will be required following each recorder paper change.

Safety Significance:

The failure of the flow-indicating controller affected only the Train B emergency ventilation supply of filtered makeup air from the outside to maintain the control room slightly pressurized with respect to the adjoining areas, and thereby preventing infiltration of unfiltered air. The isolation function was not affected. The normal supply of unfiltered outside air would have been terminated (fans stopped and dampers closed). The control room air recirculation function (air conditioning and filtration to remove radioactive material) and the TGIS mode were not affected.

Other mitigating effects include:

- When operable, Train A alone can provide the pressurization function. Train A was inoperable for about 6 hours on first occasion, and about 24 hours on the second occasion.
- The most recent dose analyses were performed based on the reactor coolant and secondary liquid being at the TS limits (1.0 μCi/gm dose equivalent iodine and 100/Ebar μCi/gm RCS and 0.10 μCi/gm dose equivalent iodine secondary). This is consistent with the Standard Review Plan. However, during the instances discussed above, the actual activity levels were less than 1 percent of the TS allowable limits. Based on this and the actual control room recirculation filter removal rate, SCE believes the post-accident dose to the control room operators would have been less than the GDC 19 limit.
- Redundant radiation detectors are located in the air ducting. Each unit is responsive to gaseous activity at concentrations as low as 7x10-7 μCi/cc of Xe-133. Alarms would alert operators to increasing radiation levels inside

the control room. A supply of respirators and self-contained breathing apparatus (SCBA) adequate for at least nine persons (the minimum operating shift crew size for two-unit operation) is stored at specified locations within the control room envelope. This equipment reduces the dose received by operators by reducing inhalation of airborne particulates, especially iodine.

SCE evaluated the safety significance of these conditions using site specific criteria, including IPEEE considerations. These conditions would not have impacted the ability of the control room operators to take appropriate accident mitigation actions. SCE concludes that there is no increase in calculated Core Damage Frequency or Large Early Release Frequency. This occurrence is categorized "Green" using the latest draft of the Reactor Safety Significance Determination Process (SDP).

Additional Information

1. In the past three years, SCE has not reported any events with a similar cause to the event reported herein. A similar, non-reported event involving CREACUS Train A occurred on June 11, 2000 (AR000600597). An operator (utility, licensed) noticed that the flow indicator needle (not the chart recorder pen) was reading full scale high, while the chart recorder flow rate pen was down scale (as expected). A dislodged service module inside the recorder caused the event. The recorder's service module likely became unlatched on June 9, 2000, when the chart paper was changed. While CREACUS Train B was operable at the time Train A was discovered to be inoperable, the Train B emergency chiller had been out of service (Train B inoperable) for routine maintenance for about 1 day during the 2 day period Train A was likely inoperable. Consequently, both units were in TS 3.7.11 Action F. which requires an immediate entry into TS 3.0.3. However, that circumstance was not recognized at that time and is being reported now as required by 10CFR50.73(a)(2)(i)(B).

   Corrective actions taken at that time included a training assignment (Priority Reading Assignment) to address the unintentional service module unlatching and the Train A CREACUS inoperability that resulted. (The Priority Reading Assignment corrective action for the event reported herein is more specific to the latching mechanism than the June 2000 assignment.) SCE is investigating why these corrective actions did not prevent recurrence.

   The safety significance of this event is similar to the other event reported herein.

2. Subsequent to the event reported herein, on November 1, 2001, a control room operator (utility, licensed) discovered the same circuit board dislodged on CREACUS Train B (AR011100048). Train B was out of service at the time of discovery for routine maintenance. The service module was immediately latched, reseating the circuit board. The paper was last changed on November 1, 2001. Therefore, the Train B flow-indicating controller was inoperable for less than one day. Train A was operable during that period. This event is not reportable, but is included here for completeness.

Figure 1 – Simplified Diagram of CREACUS

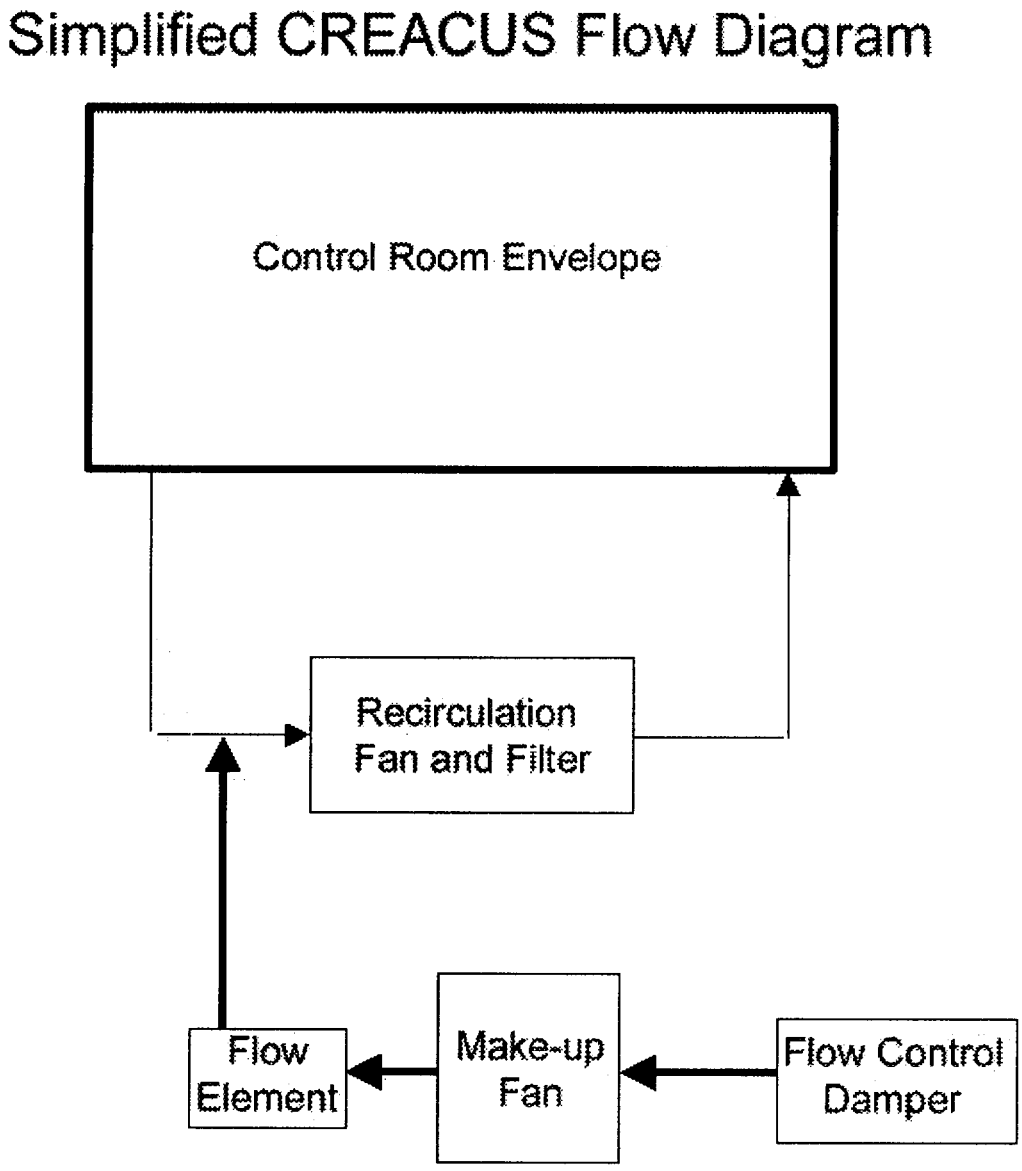

Figure 2 – Recorder Service Module Latching Mechanism

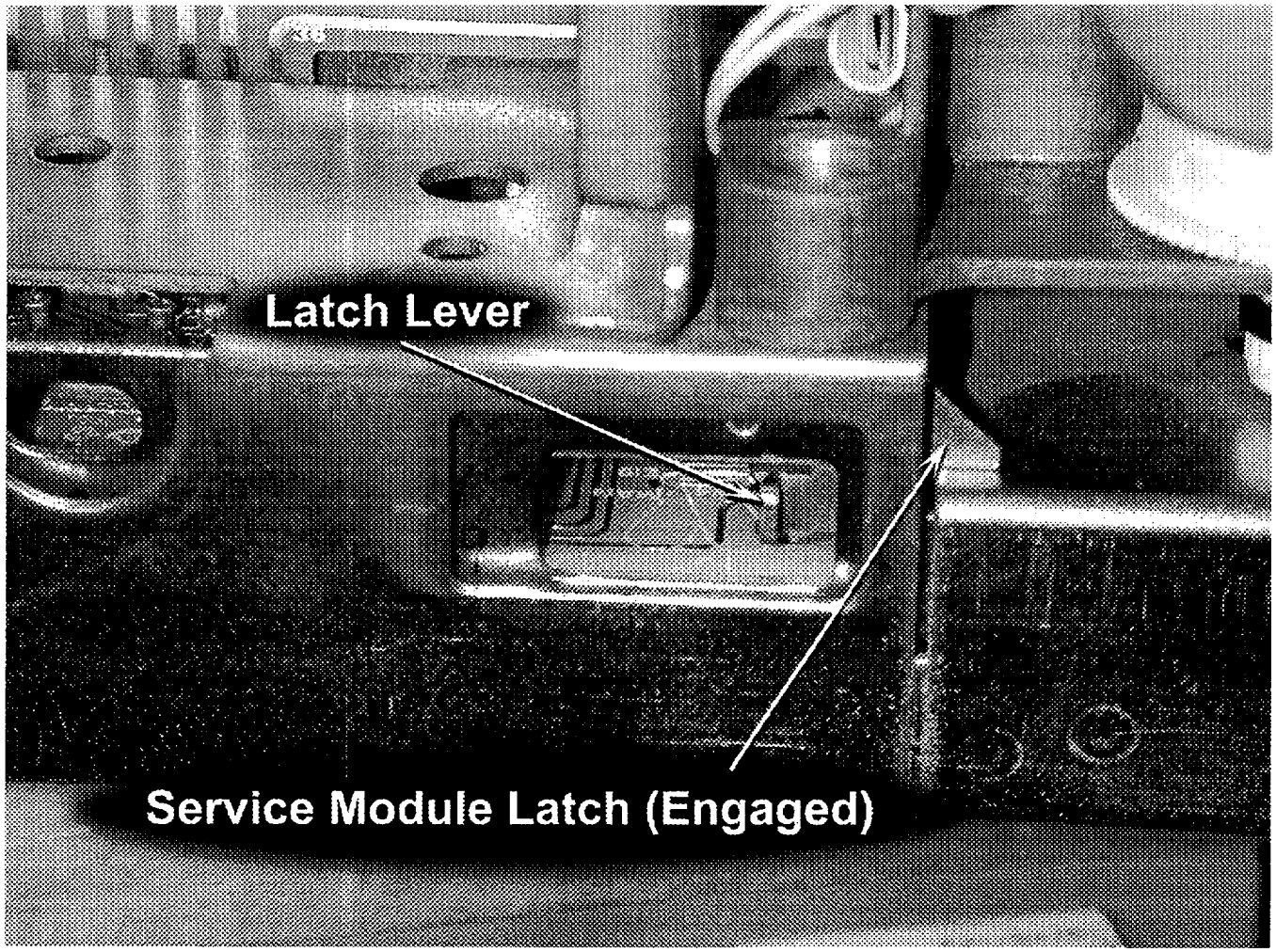

Figure 3 – Recorder Service Module Latching Mechanism

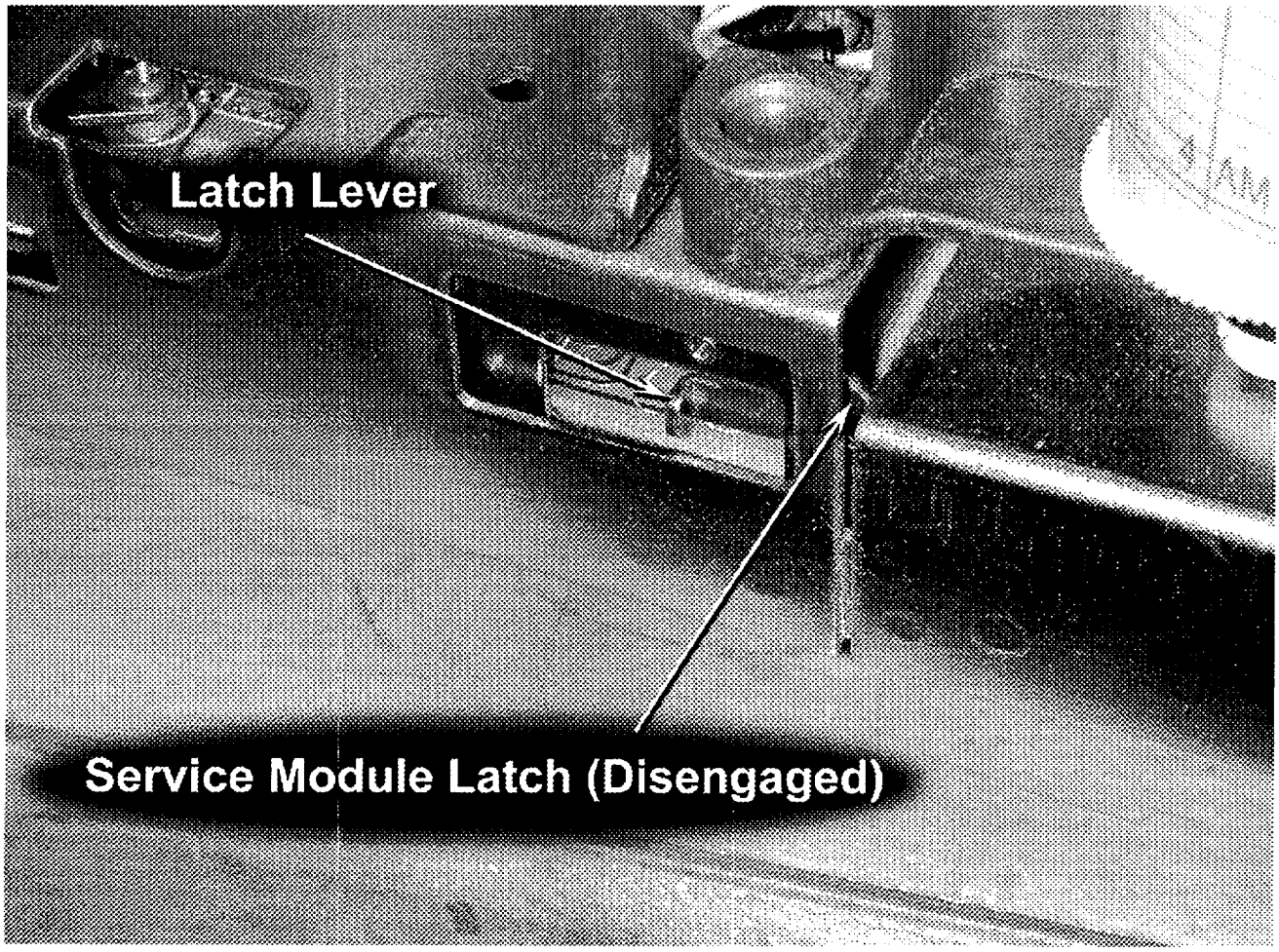

Figure 4 – Recorder Service Module Latching Mechanism