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Decision No. 92769 March 3, 1981

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Investigation on the Commission's own motion into the feasibility of establishing various methods of providing low-interest, long-term financing of solar energy systems for utility customers.	OII No. 42 (Filed April 24, 1979)

ORDER MODIFYING DECISION NO. 92251 AND SETTING FURTHER HEARING

On September 16, 1980, we issued D. 92251 establishing demonstration solar financing programs for PG&E, SDG&E, Edison, and SoCal Gas. After consideration of several petitions for modifications or rehearing, we issued D. 92501 on December 5, 1980. D. 92501 modified D. 92251 and contained several proposed modifications on which further comments were requested. D. 92501 also set further hearings on the question of extended pro rata warranties.

All comments on the modifications proposed in D. 92501 have been considered. The issue of extended pro rata warranties was submitted on February 24. In addition, several suggestions to clarify provisions of D. 92251 and D. 92501 have been made and preliminary market penetration data regarding utility credits has become available.

This order is divided into three parts. First is a discussion of the comments on the proposed modifications in. D. 92501

and decisions on these proposals. The second section will briefly discuss several nonsubstantive or clarifying modifications, most of which are self-explanatory. The third section addresses the issue of consumer protection measures, including extended pro rata warranties.

Confusion caused by repeated modification of the demonstration program can have a deleterious effect on the market. Final decisions must be made and the demonstration must be permitted to proceed on a basis of certainty. We intend this to be the last order modifying the terms of D. 92251 with three exceptions: possible modification of incentives in the single family gas market, finalization required of consumer protection measures which will flow from the further hearings set herein and adjustments that may be necessitated by the mid-point review of the demonstration during 1982.

I. MODIFICATIONS PROPOSED IN D. 92501

A. Mobile Home Eligibility

Several comments urged a change in criteria for eligibility of mobile home owners. We had proposed to grant eligibility to those who paid property taxes and deny eligibility to those who paid vehicle taxes. Our intent was to determine eligibility based on the permanency of the dwelling.

We are informed that recent changes in laws establishing mobile home taxes would create serious inequities. All mobile homes purchased prior to July 1980 must pay vehicle tax. All mobile homes purchased after July 1980 will pay property tax. Because we require a residence to be occupied on January 29, 1980 to be eligible for the demonstration, the effect would be to preclude participation by mobile home owners.

We modify the mobile home eligibility criteria so that all mobile homes except those clearly in transient use can qualify for the demonstration.

B. Participation by Customers of Municipal Utilities

In D. 92501, we proposed criteria by which customers of municipal utilities might be able to participate in the demonstration. One municipal utility, Palo Alto, specifically noted it was developing its own solar financing program and did not want to pay for PG&E's as well. Both PG&E and Edison counseled against permitting participation by customers of municipal utilities. Such participation raised

significant legal and policy questions, they alleged. In particular, the jurisdiction of the Federal Energy Regulatory Commission over wholesale transactions was noted. Obtaining F.E.R.C. approval could needlessly delay the demonstration. We conclude that our proposal to include customers of municipal utilities under certain conditions was unwise and do not adopt it.

C. Do-it-yourself Installation Requirements

PG&E and others have commented on the question of requirements for do-it-yourself installations. To remove any doubts, we reemphasize that do-it-yourself installations must meet the same criteria as contractor-installed systems with one exception. That exception, as discussed in D. 92501, relates to the contractor's warranty. Since there is no contractor, by definition, there can be no insistence on a contractor's warranty. All other requirements, including conformance with the installation checklist, manufacturer's warranties, and diagnostic inspections are the same.

Regarding manufacturer's warranties, we note that we have extended applicability of state tax credit requirements pending hearings on alternative consumer protection measures. Failure of a manufacturer to comply with these requirements at this late date borders on fraud. We cannot establish special standards in the do-it-yourself market which curry favor to unscrupulous manufacturers who conduct their business in willful disregard of known tax credit requirements.

D. Second Homes and Rental Homes

PG&E and SDG&E commented that our limitation on eligibility for second homes could be misinterpreted to deny eligibility to certain owners of rental property. We agree and modify Section II (5) of D. 92501 to read as follows:

> "Given the limited market penetration objectives of this demonstration program, only one rebate will be allowed for an owner of more than one owner-occupied dwelling. Single-family units being rented and not used as a vacation or second home shall be considered single-family units for purposes of the demonstration program market penetration goals and rebates. The owner shall so verify in writing.

E. Edison Multi-family Rebates

In response to the proposed definitions regarding multi-family installations, Edison has requested approval to modify the rebates it may provide to customers in multi-family buildings or condominiums in which a central solar collector system may serve several individual backup water heaters. Edison seeks authorization to pay a $700 rebate to the owner of each unit participating in the central solar collection system.

Edison notes this is less than one-half the credit it will offer to single-family homeowners and is thus in roughly the same proportion to its single-family credits as are the multi-family credits of the other utilities. Still, the Edison proposal would be more than double that available to customers in similar situations served by the other utilities. We do not adopt the proposed modification and shall require Edison to offer the smaller multi-family credits available in other service areas.

F. Timing of Inspections

In response to D. 92501 although addressing a matter not issued in D. 92501, SDG&E has requested deletion of the requirement that all utility inspections be conducted within ten days of notice of completion by the contractor or be waived. SDG&E correctly notes this requirement is most necessary in utility loan situations. Loans are not available during the interim (before March 1, 1981) and are not available at all to SDG&E and Edison customers. We also note that SDG&E has had a tremendous response to its rebate program, particularly in relation to its size. This has created obvious management problems for SDG&E to meet the 10-day deadline.

Still, customers desiring rebates are also entitled to prompt inspections and determinations. Also, we have encouraged customers to retain final payment to the contractor until utility

approval of the system is obtained. It would be most unfortunate if lengthy utility delays in inspections resulted in economic harm to solar contractors.

The nature of the rebates themselves provides a solution that can address each of these seemingly conflicting concerns. Pursuant to D. 92251, rebate payments do not commence until 90 days after the installation passes inspection. By triggering rebate payments in another way, SDG&E customers need not experience delays in receiving their rebates if SDG&E is unable to meet the demand for inspections in a timely manner.

Thus, for SDG&E, we shall modify the provisions for payments of rebates for installations occurring between January 29, 1980 and March 1, 1981. For these installations, SDG&E shall commence rebate payments 90 days after the installation has passed inspection or 100 days after notice is given to SDG&E that the installation is ready for inspection, whichever occurs first. This will give SDG&E up to 90 additional days in which to complete inspections of interim installations. If SDG&E is unable to inspect an installation during this extended period, rebates shall commence as scheduled. If SDG&E has inspected a system on a delayed basis pursuant to this modification, has found the installation not eligible for rebates, and on subsequent reinspection finds the installation eligible, rebates shall commence pursuant to this modified schedule. An installation which does not pass inspection shall not, of course, be eligible for rebates.

II. MODIFICATIONS FOR CLARIFICATION

In several comments regarding both D. 92251 and D. 92501, suggestions for changes in language were made to clarify intent, eliminate redundancy, and remove conflicts with existing law. These changes are noted below and should be generally self-explanatory. In the interest of brevity, we shall not discuss in detail the precise manner in which each such change improves our previous decisions.

A. Utility Security Interest for Loans

SoCal has recommended a modification of language in D. 92251 and D. 92501 relating to security interests. We adopt most of the recommended language in that it best fulfills our intent regarding security interests as stated in D. 92251. We shall require that:

> "The utility security shall, by its terms, be subordinated to subsequent voluntarily assumed liens attaching to the real property through agreements entered into by the original borrower or his or her spouse, with the proviso that no more than 90% of the fair market value of the property shall be encumbered at any time."

B. Installation Checklist

Several suggestions for modification of the installation checklist were included in comments we received. Items 1, 4, 5, 6, 13, 21, 22, 23, 35, 37, 38, 39, 40, 46, 47, 48, 50, 51, 52 and 9(c) have been changed and a revised checklist for use commencing March 1, 1981, is attached to this decision as Appendix A. Proposed changes which are not included in the revised checklist have not been adopted.

C. Late Payment Charge

SoCal has brought to our attention the provisions of Civil Code Section 2954.4 which limit late payment charges on loan installments to 6% of the installment due or $5, whichever is greater. We shall modify our authorization to the utilities regarding late charges to conform to Civil Code Section 2954.4.

D. Diagnostic Inspection Requirements

SDG&E has proposed several modifications to the list of items to be checked during one and five year diagnostic inspections. These recommendations are a significant improvement and will be adopted as set forth in Appendix B.

E. Triplexes and Condominium Rebates

SDG&E offered several modifications to our proposed eligibility rules for triplexes and condominiums. Some of the suggestions of SDG&E are well taken and we will modify these rules to read as follows:

> Triplexes and condominiums - if a central system serving all units is installed, the building will be considered a multi-family residence, eligible for an $8 credit per unit served. In the case of a condominium, the credit will be paid to whomever pays the water heating utility bill which may be the individual owners or the homeowner's association.
>
> If a single system is installed for each unit, each unit will be considered a single-family residence, eligible for a single-family credit or loan. If two condominium owners jointly install a system, they will receive one single-family loan or credit. If three or more, but less than all, units jointly install a system, they will be considered a family unit, with each participating owner eligible for a credit of $8 per month.

F. Multi-unit and Electric Markets

Early information also indicates that market penetration is not proceeding as rapidly as desirable in the multi-family and electric retrofit markets. At least for the electric market, one explanation may be the difficulty of contractors in finding single-family electric homes or subdivisions. To assist the solar industry to penetrate these two markets, we shall ask each electric utility to file with us within 45 days a plan to improve market penetration in these two markets. The filed plans will be reviewed in publicly noticed informal workshops and then revised as desirable.

G. SDG&E Single Family Gas Credits

We have already noted that SDG&E's entire allocation of single-family gas solar retrofit credits has been committed. To assist in evaluating the demonstration, we shall ask SDG&E to report to us on the geographic dispersion and income levels of the recipients of these credits.

III. CONSUMER PROTECTION MEASURES

By Decision No. 92251, we required all solar water heating systems eligible for the demonstration program to have "a full five year parts and labor warranty and an extended pro rata parts warranty for an additional five years". Later, however, we concluded in Decision No. 92501 that there was no evidence to support the pro rata portion of this requirement and that rehearing on this issue should be held. With respect to the first five-year full warranty, we found sufficient support in the record for that requirement, but concluded that to cure existing ambiguities the provisions of the warranty should be defined by the tax credit rules established by the California Energy Commission (20 Cal. Admin. Code § 2601). Parties were given a 30-day period in which to comment on this proposed modification.

On February 18, 1981, Decision No. 92745 was issued to clarify Decision No. 92501 by excluding the basic five-year full warranty as proposed by Decision No. 92501 from "the Commission's adopted system and installation requirements" which must be met after March 1, 1981.

Rehearing on the issue of extending either manufacturers' or installers' warranties an additional five years on a prorated basis were held in Los Angeles on February 5 and 6, 1981, and in San Francisco on February 11, 1981. During these hearings, testimony was presented by the Commission staff, CalSEIA, SDG&E, and Gerhardt Rohlfs Voss, a solar energy businessman. It was the staff's position that a prorated manufacturer's warranty should be provided in years 6 through 10 to cover the costs of replacing

defective collectors, tanks, and heat exchangers. Under the staff's proposal, such an extended warranty would not be required for pumps and controls. All other parties testifying in the proceeding, however, either directly opposed an extended prorated warranty or questioned its effectiveness to protect consumers and to ensure system durability. Testimony regarding alternative consumer protection measures was also presented.

On February 24, 1981, the matter was submitted on the filing of concurrent briefs. At the request of the Administrative Law Judge, the parties were asked to address not only the question of the appropriateness of requiring an extended prorated manufacturer's warranty, but also the admissibility of certain industry surveys and the parties' interpretation of the Commission's basic five-year warranty requirement, as well as the utilities' obligation to offer backup service agreements.

The record and legal analysis resulting from the rehearing has provided the Commission with further valuable insight into the problems associated with providing consumer protection and ensuring reliable service which will in turn build consumer confidence in solar water heaters. (Decision No. 92551, at p. 53.) While testimony was presented both in support of and in

opposition to an extended warranty for parts, the entire record reflects several basic problems encountered in providing any extended consumer protection in the relatively young solar energy industry. In CalSEIA's opinion these problems can be summarized as follows:

1. Because of general uncertainty, caused by a lack of available data, prediction of extended warranty costs at this time is most difficult. According to CalSEIA such uncertainty could result in conservatively high charges for any additional warranties.
2. Irresponsible companies who might provide the paper needed for an extended warranty, but have no thought of honoring such a warranty, could adversely affect both responsible companies and the public.
3. Manufacturers and contractors struggling now with the present warranty requirements provided by the Energy Commission may be further confused by any additional warranty.

CalSEIA also suggests that while an extended warranty may have merit, such protection is meaningless without any procedures or mechanisms to enforce it. In addition, PG&E asserts that the problems associated with extended warranties, as well as vagueness concerning the Commission's requirement in Decision No. 92251 relating to a utility's obligation to offer backup service agreements, make it difficult to predict the costs and nature of those agreements as well.

Parties opposed to the extended pro rata warranty also proposed alternatives to any warranty required beyond either the Energy Commission's requirements or the basic five-year full warranty endorsed by this Commission. It was the opinion of SDG&E's witness that because longer warranties may entail additional costs and because SDG&E's customers have shown a desire to pay lower prices rather than wait for extended warranties, any warranty beyond those required under the Energy Commission's tax credit guidelines should be optional. Specifically, SDG&E proposed the following:

> "Contractors and retail sellers must offer as an option written five-year warranties covering the collectors, tank, pump, and controller and/or labor where applicable. The reasonable additional cost must be clearly identified for the customer." (Exhibit No. 104.)

CalSEIA suggested that instead of extended warranties, consumer protection could be afforded by broadening the base of the CalSEAL program,providing a "bonded warranty" program under which a contractor would give or sell his customer a policy to ensure contractor compliance with the adopted warranty; obtaining a CalSEAL label as a condition of participation in the CalSEAL program; or providing contractor service agreements, good for one year only and subject to renewal at an adjusted price to avoid the cost prediction problems of longer terms. Mr. Voss questioned the effectiveness of warranties in the absence of system design criteria

provided to ensure that customers will receive the promised performance from their systems.

In addition to the record developed on rehearing, we have received comments from Western General Insurance Company to establish an alternate consumer protection program in the form of service insurance. Prior to issuing D.92251 we had received other proposals for alternative consumer protection programs from CalSEIA and Martin & Associates. In D.92251 we encouraged:

> "...the filing with this Commission...of a plan to assume responsibility for consumer protection functions in this demonstration. Such a filing should include a thorough description of proposed budgets, method of operation, manner of organization, and an indication of voluntary subscription broad enough to be considered a reasonable alternative to any or all of the consumer protection measures adopted in this order. Upon receipt of such a filing, we will initiate supplementary hearings to fully consider the plans."

On the basis of the testimony presented during rehearing, the three proposals for alternative consumer protection measures, and the comments we have received in response to Decision No. 92551, we have concluded that further hearings should now be set for the purpose of considering all proposed consumer protection measures beyond the warranty requirements required by the California Energy Commission. Because we have completed hearing and received briefs on the appropriateness of an extended prorated warranty, no further evidence will be taken on this issue. We will, however, defer ruling on the merits of that proposal until the record is complete on the entire question of consumer protection. The record and briefs relating to the extended prorated warranty, as well as the parties' interpretation

of prior Commission orders, will be combined with the record of the further hearings for a final determination of the consumer protection required to promote product durability and enhance customer confidence in the solar industry.

Prepared testimony in these further hearings, to commence April 13, 1981, in San Francisco, California, shall be served upon all parties and the Commission 10 days in advance of hearing and shall include details on at least the following:

1. How the proposed program would be superior to the warranties required in Decisions Nos. 92251 and 92501 in terms of cost, service to the customer, and ease of administration;

2. What the cost of the proposed program will be to the customer, the utility, the installer, and the manufacturer;

3. Whether the program is proposed as an exclusive program and if so, whether it would meet the requirements of state and federal laws protecting fair competition; and

4. If it is not proposed to be exclusive, how the proposed program would interact with other similar or related programs.

Parties will also have the opportunity to address the issue of the extent to which a utility should provide a backup service agreement.

Compliance with state tax credit warranty requirements shall suffice for systems to be eligible to participate in the demonstration program if they are installed pursuant to a contract executed

prior to final action on alternative consumer protection measures. The requirement of utility backup service agreements will be suspended until the completion of the further hearings.

Finally, with respect to the record developed on rehearing, objections were made to the admissibility of two industry surveys concerning warranty compliance and costs. (Exhibits Nos. 107 and 108.) During hearing, it was ruled that Exhibit No. 108 would not be received into evidence; however, a ruling on Exhibit No. 107 was deferred until late-filed exhibits providing a foundation for the survey were filed and parties had an opportunity to argue the exhibit's admissibility. We have concluded that this survey is admissible; however, all foundational testimony and cross-examination will be considered in determining the weight which will eventually be given that evidence.

Findings of Fact

1. There is an adequate basis for hearings to consider alternative consumer protection measure, as discussed herein.

2. Further modification of the standard installation checklist adopted in D. 92251 is warranted in the interest of clarity and to promote the broadest availability of solar systems.

3. Edison's proposal to modify its multi-family rebates is reasonable but cannot be justified when compared to rebates offered by other utilities in this market.

4. Participation in the demonstration program by owners of mobile homes could be precluded by eligibility requirements in D. 92501.

5. Procedures for payment of rebates for interim installations in the SDG&E service area should be modified to account for heavy demand for the program and the consequent burden on SDG&E.

6. Modification of the list of items to be checked during diagnostic inspections is warranted in the interest of clarity.

Conclusions of Law

1. Further hearings should be set to consider alternative consumer protection measures.

2. Civil Code Section 2954.4 limits the amount of late payment charges for delinquent installment loan payments.

3. The modifications to D. 92251 and D. 92501 ordered herein are reasonable and in the best interests of the ratepayers.

4. Decisions on extended pro rata warranties should be deferred until the time of decisions on alternative consumer protection methods.

O R D E R

IT IS ORDERED that:

1. Decisions 92251 and 92501 are modified as specified herein.

2. Items 1, 4, 5, 6, 13, 21, 22, 23, 35, 37, 38, 39, 40, 44, 47, 48, 50, 51, 52 & 9(c) of the standard installation checklist should be modified as specified herein. (See Appendix A)

3. The diagnostic inspection checklist should be modified as specified in Appendix B.

4. Further hearings will commence on April 13, 1981 at 10:00 A.M. in the Commission Courtroom at 350 McAllister St., San Francisco, to consider alternative consumer protection measures. All testimony proposing an alternative consumer protection measure shall include the information specified herein and shall be served on all parties of record no later than 10 days prior to hearing. No further hearings shall be held nor further evidence presented on the question of extended pro rata warranties. Pending final action on warranties and alternative consumer protection measures, state tax credit warranty requirements shall be applicable to the demonstration program.

5. Within 120 days of the date of this order, SDG&E shall report to the Commission on the location of single-family residences with gas water heaters which have been retrofit with solar water heaters and where an application for rebates has been made. The report shall include an analysis of whether the solar installations encompass a broad range of geographic areas and income groups in its service area.

The effective date of this order is the date hereof.

Dated MAR 3 1981, at San Francisco, California.

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APPENDICES A AND B

CHECK LIST FOR SOLAR WATER HEATER SYSTEMS INSTALLED AFTER MARCH 1, 1981

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APPENDIX A

		Yes	No	Not Applicable
*1.	Does the system have a building permit?	___	___	___
*2.	Has the system been inspected by the local building department?	___	___	___
*3.	Unless electricity is presently being used for water heating and if natural gas is available, is natural gas used for the backup system?	___	___	___
*4.	Does the system have a back flow preventer for any connections to the nonpotable side of the system if required by local ordinance?	___	___	___
*5.	Has valving for flushing and draining system been installed unless prohibited by manufacturer's specifications?	___	___	___
*6.	On a closed loop system, has a sampling or drain valve been provided in the collector loop?	___	___	___
*7.	Has valving been arranged so that both solar and conventional systems can operate independently?	___	___	___
*8.	Are flow directions indicated?	___	___	___
*9.	Is all plumbing in the solar system insulated? (All potable and nonpotable hot water pipes must be insulated. All cold water pipes must be insulated for a distance of 2 linear feet from connection to hot water sources. 1/2" wall thickness required indoors; 3/4" wall thickness outdoors.)	___	___	___

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

APPENDIX A

	Yes	No	Not Applicable
*10. Is insulation which is exposed to the weather protected from a solar degradation and weathering?	___	___	_____
*11. Are joints in insulation either taped or glued according to manufacturer's specifications, if any?	___	___	_____
*12. Are exposed components other than solar collectors protected from freeze damage?	___	___	_____
*a) Air vent	___	___	_____
*b) Vacuum breaker	___	___	_____
*c) Temperature and pressure relief value	___	___	_____
*d) Expansion tank	___	___	_____
e) Other	___	___	_____
13. If the system is closed loop system, go on to the following questions. If it is a pressure system, skip the following section. The fluid in the closed loop is_____.			
Item 1 - Does the system contain a non-toxic fluid?	___	___	_____
Item 2 - If the system contains a non-toxic fluid, does it have a single wall heat exchanger?	___	___	_____
*Item 3 - If the system is filled with a toxic fluid, does the system have a double-walled heat exchanger?	___	___	_____

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

APPENDIX A

	Yes	No	Not Applicable
*Item 4 - On non-toxic fluid system, are closed loop parts labeled with a warning to prevent the use of toxic fluids in this system?	___	___	___
*Item 5 - On toxic fluid systems, are fluid lines marked with a warning lable "Danger, Water Not Drinkable" - "Poison".	___	___	___
*14. Is plumbing 3/4 inch type M copper or better?	___	___	___
*15. Has piping been installed so that all freeze-protected plumbing slopes to drain?	___	___	___
*16. Have dielectric unions been properly installed at all copper-ferrous joints?	___	___	___
*17. Are all pipe runs vertical and horizontal adequately supported? (fasteners at no greater than 5-foot intervals)	___	___	___
*18. Are temperature and pressure relief valves installed on the system in the proper places? (On pressurized systems this is on the tank. On closed loop systems, is on the tank and on the collector loop.)	___	___	___
*19. Are the pressure and temperature relief valves discharged to drain in a direction to eliminate any possible scalding or property damage?	___	___	___

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

APPENDIX A

	Yes	No	Not Applicable
*20. Are all temperature and pressure relief valves from closed loop systems installed in such a manner to prevent damage to health and property? (These fluids are sometimes poisonous and proper disposal should be accounted for.)	___	___	___
*21. Has a vacuum relief valve been installed in the system? (Not applicable to closed loop systems with expansion tanks.)	___	___	___
*22. Are the collectors manifolded in a reverse return, parallel manner (an equal flow path length through all collectors) or are other flow balancing techniques are employed?	___	___	___
*23. Has the circulator pump been installed according to manufacturer's specifications?	___	___	___
*24. Has the expansion tank been located on the suction side of the pump?	___	___	___
*25. Are the following components located in such a manner as to allow access for cleaning, adjusting, servicing, examination, replacement, or repair?	___	___	___
*a. Storage Tank	___	___	___
*b. Pump	___	___	___
*c. Heat Exchanger	___	___	___
*d. Controller	___	___	___
*26. Has the check valve for reverse flow prevention been installed in a proper manner?	___	___	___

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

APPENDIX A

		Yes	No	Not Applicable
*27.	Is the check valve of the proper material for the type of fluid in the system?	___	___	___
*28.	Is the storage tank properly connected to the conventional water heater?	___	___	___
*29.	If supply water pressure is in excess of 80 pounds per square inch or the working pressure rating of any system component, has an approved pressure regulator preceded by an adequate strainer been installed?	___	___	___
*30.	Has the completed system been installed in a neat and orderly fashion?	___	___	___
*31.	Is a device which indicates that the system is operating installed?	___	___	___
*32.	Does the storage tank have a minimum insulation of R12?	___	___	___
*33.	Does the conventional water heater have an extra insulation blanket or a minimum insulation of R12?	___	___	___
*34.	Have the plumbing connections from the storage tank to the solar collectors been installed in a manner to promote thermal stratification?	___	___	___
*35.	If the storage tank is located outside, is its insulation material protected from weather and solar degradation?	___	___	___
*36.	Has a tempering valve or other temperature limiting device been installed to limit the exit temperature of the hot water?	___	___	___

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

APPENDIX A

	Yes	No	Not Applicable
*37. If the storage tank is installed in an attic, is it provided with a drip pan and an outlet to an adequate drain?	___	___	___
*38. Have collectors been mounted with WEEP holes - if any, at the lowest end of the collector?	___	___	___
*39. Is adequate drainage available in the collector array for leaks that may occur?	___	___	___
*40. Has access to gutters, downspouts, and caulking been allowed for?	___	___	___
*41. Are minor repairs and preventive maintenance allowed for in the collector installation?	___	___	___
*42. Has flashing or a roof jack been installed to prevent water leakage at any piping penetration through the roof? (1)	___	___	___
*43. Are joints between the framework and the rest of the building caulked and/or flashed to prevent water leakage? (1)	___	___	___
*44. Are collectors installed so that water flowing off of the collector surfaces cannot freeze and cause damage to roof or wall surfaces? (1)	___	___	___
*45. Using a solar sighter, do the collectors have a clear unobstruced view of the sun between the hours of 10:00 and 3:00 in December?	___	___	___

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

(1) No warranty, express or implied, is given by the utility that water leakage or freeze damage will not occur as a result of the installation of the solar system.

APPENDIX A

	Yes	No	Not Applicable
*46. Are joints between the framework and the rest of the building caulked and/or flashed to prevent water leakage? (1)	___	___	_____
*47. Are collectors installed so that water flowing off of the collector surfaces cannot freeze and cause damage to roof or wall surfaces? (1)	___	___	_____
*48. Is the rack constructed in solid manner?	___	___	_____
*49. Has a minimum clearance of 2-1/2 inch been allowed between the collectors and the roofs and between the collectors and any side wall? (This does not apply when the collectors are integrated into the roof)	___	___	_____
*50. Are control sensors located within one inch of and near the bottom of the storage tank?	___	___	_____
*51. Are control sensors located within one inch of and at the top of the solar collectors outlet or within the collector box according to manufacturers specifications.	___	___	_____
*52. Are sensors for collectors and storage tank attached tightly for the best possible thermal transfer.	___	___	_____

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

(1) No warranty, express or implied, is given by the utility that water leakage or freeze damage will not occur as a result of the installation of the solar system.

APPENDIX A

	Yes	No	Not Applicable
*53. Is the system controller properly grounded? (Not applicable for systems of 30 volts or less.)	___	___	___
*54. Has the control circuit wiring been color-coded or otherwise labeled so that wires are readily traceable?	___	___	___
*55. Has a qualified person in both solar and conventional water systems put the system through at least one startup cycle, including all modes of operation?	___	___	___
*56. Has a timeclock been installed on the electric water heater so that use of electricity can be limited to the hours of midnight to 5 AM should the customer desire to take advantage of solar incentive rates.	___	___	___

NOTE: All answers of this check list that have an * must be answered by YES or N/A if system was installed after March 1, 1981.

APPENDIX A

REQUIRED INSTRUCTION AND DOCUMENTATION IN THE SYSTEM MANUAL

		YES	NO	N/A
*1.	Does the System Manual provide the customer with information on eliminating all backup energy use during summer months?	____	____	____
*2.	Have fill weights, pressure ratings, temperature ratings and other useful information for servicing and routine maintenance of the system been included in the manual?	____	____	____
*3.	If hazardous fluids are used in the system, have proper procedures for their use, including first aid handling and safe disposal instructions, been supplied in the manual?	____	____	____
*4.	If roof mounted solar components exceed 10 pounds per square foot, has the structural integrity of the roof and mounting been approved by a registered structural engineer?	____	____	____
*5.	If the collector rack is of a commercial type, has the general design been approved by a registered structural engineer?	____	____	____
6.	Is a complete system diagram part of the owner's manual?	____	____	____
*7.	Do operation instructions include provisions for the system if the owner leaves for a vacation and hot water use is nil?	____	____	____
*8.	Does manual provide instruction on valving off different sections of the system in emergency situations?	____	____	____

(CERTIFICATION OVER)

APPENDIX A

*9. Has the contractor certified that --

a. The warranty provided with the installation is a copy of the warranty submitted for program acceptance? ____ ____ ____

b. The system complies with the program sizing requirements for flat plate collectors which are rated by TIPSE or equal? ____ ____ ____

c. The system complies with program freeze protection requirements or has obtained a staff waiver? * ____ ____ ____

d. The system will provide a minimum 60% annual solar contribution to the resource energy needs? ____ ____ ____

e. The installation complies with the currently published minimum standards of the following: ____ ____ ____

1. Title 24 - CEC Residential Energy Conservation Standards

2. SMACNA - Sheet Metal and Air Conditioning Contractor's National Association, Inc., Solar Installation Standards.

3. NSF - National Sanitation Foundation.

4. USEC _ Uniform Solar Energy Code.

* Recirculation of hot water from solar storage for freeze protection, is permissible without a staff waiver in installations below 1,000 elevation.

APPENDIX A

f. Closed loops contain a nontoxic fluid or if toxic are so marked and contain a double wall heat exchanger. ____ ____ ____

g. The storage tank if buried is anchored to prevent flotation. ____ ____ ____

h. Roof mounted components when operating do not exceed 10 pounds per square foot or that an engineering roof load report has been approved? ____ ____ ____

APPENDIX A

CUSTOMER SIGNATURE CONTRACTOR SIGNATURE & LICENSE NO.

Financing assistance from the utility cannot be obtained until the utility has inspected the system and certified its eligibility for financing. The California Public Utilities Commission recommends that customers pay the contractor only 60 percent of the contract price until the utility representative certifies below that the system is eligible for financing assistance.

UTILITY FIELD REPRRESENTATIVE

APPENDIX A

A. Customer name and address _____

B. Customer account number _____

C. Date system installed _____

D. Persons in household present _____

E. System installer _____ Salesperson _____

F. System cost (gross)

G. Customer's expected solar contribution _____%

H. System

1) Collectors

Brand _____

Model _____

Number _____

Ft^2(Aperature) _____

A. Glazings	YES	NO
1. single glass	_____	_____
2. double glass	_____	_____
3. single glass low iron	_____	_____
4. double glass low iron	_____	_____
5. single lexan	_____	_____
6. single fiberglass	_____	_____
7. Other _____	_____	_____

B. Absorber _____		
1. all copper	_____	_____
2. copper, aluminium	_____	_____
3. all aluminium	_____	_____
4. steel	_____	_____
5. Other	_____	_____

2) Tanks	Storage	Auxiliary Water Heater
a. size	_____	_____
b. brand and model number	_____	_____
c. added insulation	_____	_____
d. type of backup	_____	_____

APPENDIX A

3) Control
   a. brand and model number _____
   b. differential on (T) _____
   c. differential off (T) _____

4) Freeze protection	YES	NO
a. recirculation		
b. pressurized drain down		
c. air head		
d. drain down (nonpressurized)		
e. drain back		
f. antifreeze		
1) Type		
a. propylene glycol		
b. ethylene glycol		
c. oil		
d. other _____		

5) Heat exchanger		
a. internal on pressurized tank single wall		
b. internal on pressurized tank double wall		
c. external on pressurized tank single wall		
d. external on pressurized tank double wall		
e. internal on nonpressurized tank		

6) Pump
   a. brand and model number _____
   b. watts _____
   c. material _____

1. stainless		
2. brass		
3. cast iron		
4. other _____		

7) Collector angle from horizontal _____

8) Collector direction (in degrees with magnetic deviation compensated for) _____

(END OF APPENDIX A)

APPENDIX B

The following items shall be checked during diagnostic inspections conducted pursuant to Decision 92251.

1) Check condition of piping. Verify no corrosion or significant damage.

2) Check condition of coating on collectors to determine that there has been no significant deterioration.

3) Inspect glass or plastic collector for condition and cleanliness. Verify no significant outgassing, clouding of plastic or deformation.

4) Inspect drain opening in collector frame for blockage.

5) Check valves, fittings, and pumps for leakage. Look for indirect signs of leakage such as stains near T and P valves, etc.

6) Inspect electrical connections for safety and security. Inspect sensors lead (if possible) for condition.

7) Check any water heater blanket for condition.

8) Determine that controls and pump operate in manual mode without excessive pump noise.

9) On closed systems utilizing antifreeze, check antifreeze ph.

10) Verify no shading from trees.

(END OF APPENDIX B)